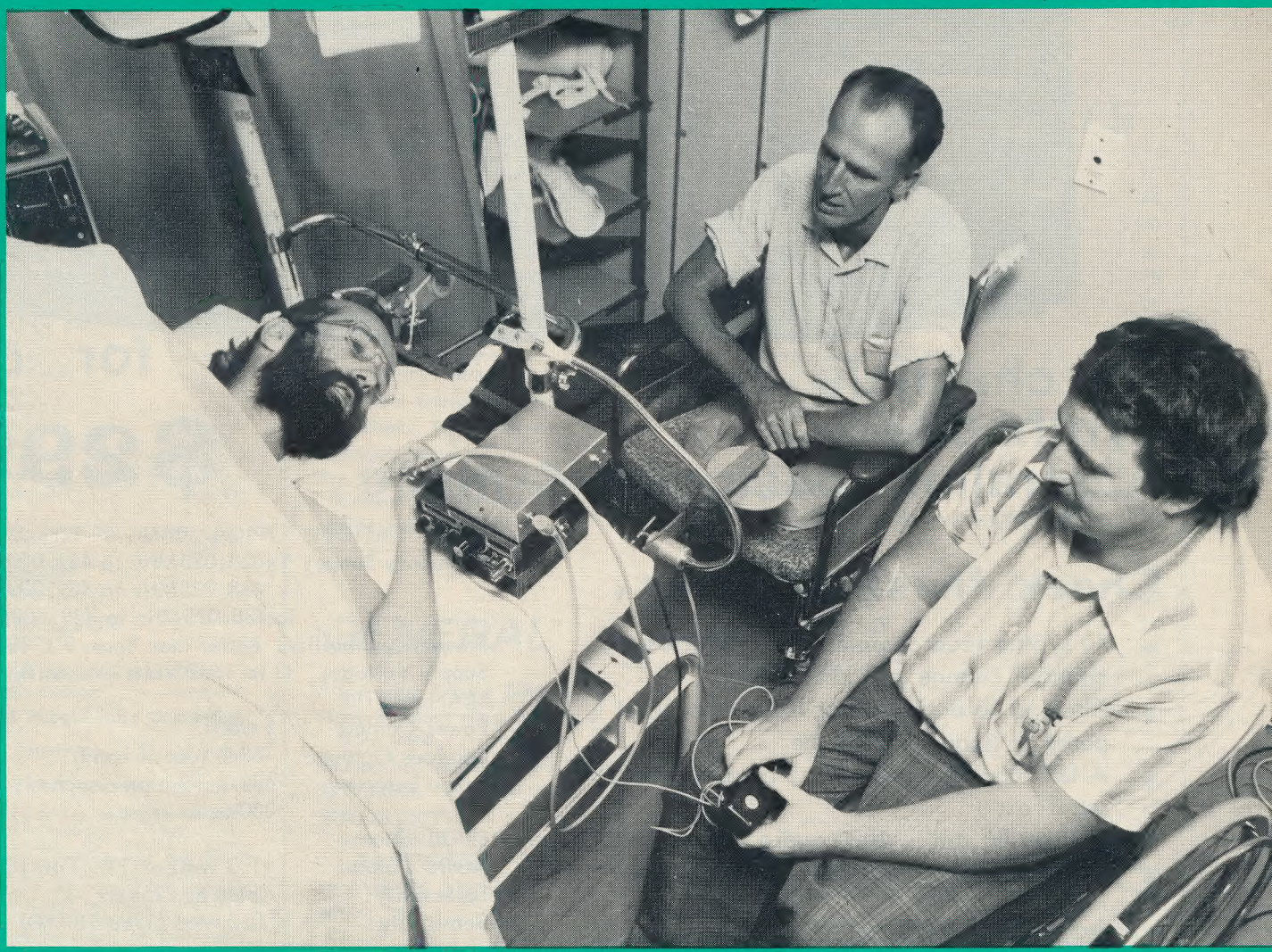
amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA



VOL. 47, No. 9 SEPTEMBER 1979

FEATURED IN THIS ISSUE:

- ★ NEW WORLD CRAZE — 10 Mx FM
- ★ REVIEW — THE DRAKE TR7
- ★ EARS FOR THAT DEAF FT101B RECEIVER
- ★ HAM RADIO FOR REHABILITATION
- ★ GETTING INTO JAMBOREE ON THE AIR

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PHILIPS

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Registered Office:
2/517 Toorak Road,
Toorak, Victoria, 3142.

EDITOR:
BRUCE BATHOLS* VK3UV

ASSISTANT EDITORS:
RON COOK* VK3AFW
GIL SONES* VK3AUI

TECHNICAL EDITOR:
BILL RICE* VK3ABP

CONTRIBUTING EDITORS:
BOB ARNOLD VK3ZBB
MIKE BAZLEY VK6HD
ROD CHAMPNESS VK3UG
SYD CLARK* VK3ASC
RON FISHER* VK3OM
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PETER MILL VK3ZPP
LEN POYNTER* VK3ZGP
BILL VERRALL VK5WV
WALLY WATKINS VK2DEW

DRAFTING:
NEIL OSBORNE* VK3YEI

PHOTOGRAPHER:
REG GOUDGE —

BUSINESS MANAGER:
PETER DODD VK3CIF

ADVERTISING AND AR LIAISON:
MARK STEPHENSON* VK3NOY

***Member of Publications Committee**

Enquiries and material to:
The Editor,
PO Box 2611W, GPO Melb., 3001

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Cover Photo

HAM RADIO FOR REHABILITATION

Left to right: Don Pugh VK6DN, Bruce Jacobs VK6ZAT and Bob Wynn VK6WY discuss amateur radio at the Royal Perth Rehabilitation Hospital — see our special article on page 23.

Photo courtesy West Australian Newspapers Ltd.

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Secretary — Mr. J. A. Adcock VK3ACA
Broadcasts— 1840, 3600, 7135 kHz — 53.032 AM, 144.2 USB and 2m Ch. 2 (5) repeater: 10.30 local time.
Gen. Mtg. — 2nd Wed., 20.00.

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Broadcasts— 1825, 3580, 7146, 14342, 21175, 28400, kHz; 2m (Ch. 42, 48): 09.00 EST.
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SA:
President — Mr. I. J. Hunt VK5QX
Secretary — Mr. W. M. Wardrop VK5NWM
Broadcasts— 1820, 3550, 7095, 14175 kHz; 28.5 and 53.1 MHz, 2m (Ch. 8): 09.00 S.A.T.
Gen. Mtg. — 4th Tuesday, 19.30.

WA:
President — Mr. Ross Greenaway VK6DA.
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Broadcasts— 3560, 7075, 14100, 14175 kHz. 28.485, 52.290 MHz. 2 metres Ch. 2 Perth, Ch. 6 Wagin. Time 0130Z.
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Broadcasts— 7130 (AM) kHz with relays on 2m Ch. 2 (S), Ch. 8 (N), Ch. 3 (NW), 09.30 EST.

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Broadcasts— Relay of VK5WI on 3.55 MHz and on 146.5 MHz at 2330Z. Slow morse transmission by VK8HA on 3.555 MHz at 1000Z almost every day.

Postal information:
VK1 — P.O. Box 46, Canberra, 2600.
VK2 — 14 Atchison St., Crows Nest, 2065 (Ph. (02) 43 5795 Tues & Thurs (10.00-14.00h). P.O. Box 123, St. Leonards, NSW 2065.
VK3 — 412 Brunswick St., Fitzroy, 3065 (Ph. (03) 41 3535 Weekdays 10.00-15.00h).
VK4 — G.P.O. Box 638, Brisbane, 4001.
VK5 — G.P.O. Box 1234, Adelaide, 5001 — HQ at West Thebarton Rd., Thebarton.
VK6 — G.P.O. Box N1002, Perth, 6001.
VK7 — P.O. Box 1010, Launceston, 7250.
VK8 — (Incl. with VK5), Darwin AR Club, P.O. Box 37317, Winnellie, N.T., 5789.

Slow morse transmissions — most week-day evenings about 09.30Z onwards around 3550 kHz.

VK QSL BUREAUX

The following is the official list of VK QSL Bureaux, all are inwards and outwards unless otherwise stated.

VK1 — QSL Officer, G.P.O. Box 46, Canberra, A.C.T. 2600.
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VK7 — QSL Bureau, G.P.O. Box 371D, Hobart, Tas. 7001.
VK8 — QSL Bureau, C/- VK8HA, P.O. Box 1418, Darwin, N.T. 5794.
VK9, 0 — Federal QSL Bureau, 23 Landale Street, Box Hill, Vic. 3128.

QSP — "DOINGS"
(ACTIVITIES, DEEDS, BEHAVIOUR)

When visiting various Clubs, Zones and attending workshop meetings, I have been struck by the eagerness of a few individuals to DO whatever they can to help in the organising and running of the Club, Zone or events conducted by one of these. In so DOING, they further the spirit of universal friendship that develops through Amateur Radio.

Unfortunately, lately these few, in the VK3 Division at least, have become even less in numbers. I suspect this may be due to decreasing social contact between Divisional members, particularly those who are not also members of a regional club.

The Victorian Division's Council wants to DO something positive and to re-establish a level of social contact between members. One proposed way of doing this is to conduct an ANNUAL VICTORIAN CONVENTION. Old friends will have an opportunity to rebuild links forged in the past and newcomers will be able to meet others of similar interests.

Other Divisions provide similar forums; this requires a LOT of hard work for a SMALL team or a FEW tasks each for a large team.

Do you have a special skill that may help your Division with their social activities? Can you spare a little time to help with the many SMALL jobs that must be done? Your Division could DO with your valuable help; DOERS are very hard to find as it means DOING.

The Oxford dictionary defines a DOER as "one who does things, not a mere talker".

Our leisure activity and the organisations who support it, especially the WIA, are most worthy recipients of your DOING.

Are you a DOER?

ERIC BUGGEE VK3ZZN
Victorian Division President ■

WHAT KIND OF A CLUB MEMBER ARE YOU?

An Oldie.

Some members are like wheelbarrows — no good unless pushed.

Some members are like canoes — they need to be paddled.

Some members are like kites — if you don't keep a string on them, they fly away.

Some members are like kittens — they are more contented when petted.

Some members are like footballs — you can't tell which way they will bounce next.

Some members are like balloons — full of wind and never down to earth.

But some members are like gems — they glow and become more valuable every day. ■

QSP

ARS AND THE FUTURE

Much thought is being given in many places to where the amateur radio service should be in the coming decade — i.e. post-WARC. The Executive of the WIA has this in mind, the main editorial in July AR by VK1DA gives this a highlight, the ARRL in January appointed a Long-Range Planning Committee to review and make recommendations concerning programmes which the ARRL is and should be providing to its members and to the amateur radio service, and the editorial in Ham Radio for June 1979 takes up the theme. The last-mentioned editorial makes the point that amateur radio in the past is like the proverbial "house that Jack built" with rooms added as they required, with light thought to future construction — or indeed to the aesthetics of the architecture. While long-range planning is hardly an exact science, it is possible — states the editorial — to anticipate some of the problems, to perceive certain distant opportunities and to develop appropriate recommendations. In planning, positive results require much effort on a continuing basis by a large number of concerned amateurs. ■

OOPS — WRONG FORD

After Tsuneyoshi Yamano JA5HTP and his wife, Akiko JA5IBW, contacted Gerald R. Ford WA7KYZ in the State of Washington on 28th February, they sent the customary QSL card.

However, the post office, seeing the name Gerald R. Ford, delivered the card to former President Gerald R. Ford in Palm Springs!

After the initial confusion, the card was finally routed to WA7KYZ in Washington — and President Ford also sent a personal reply to the Yamanos in Japan.

After eight years of operation, and 3,800 QSOs the contact with WA7KYZ was the first with a US amateur for the Yamanos.—Worldradio, May 1979.

JA5HTP and his wife JA5IBW are keen 6 metre operators and are well known to VK amateurs.—Ed. ■

900 MHz AMATEUR BAND

According to Ham Radio May 1979, Canadian amateurs may be granted 902-928 MHz on a shared basis later this year in exchange for 420-430 MHz to be assigned shortly to another service. Also mentioned is that international support for new amateur HF bands at 10, 18 or 24 MHz seems to be building up, but warns that even if these are accepted at WARC 79 it will be a number of years, possibly, before present users can be moved out before amateurs could be allowed in. ■

AUSTRALIAN LICENCES

As at 31.3.1979 there were 11,400 amateur licences issued in Australia, of which 5,717 were full calls, 2,973 limiteds and 2,690 novices, plus 20 in other territories. The State breakdowns were 3,842 in NSW, 3,232 in Victoria, 1,481 in Queensland, 1,392 in SA and NT, 819 in WA, 366 in Tasmania, and 248 in ACT. In the two largest States there were 2,035 full calls in VK2, 1,545 in VK3, 871 and 1,027 limiteds and 936 and 660 novices respectively. Out of the total 179,332 CB licences issued 1,084 were for UHF. ■

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WIANEWS

CALLBOOK

By the time this appears in print the 1979 WIA Amateur Radio Call Book should have been on sale for a week or two.

The Call Book Editor is well aware that there will be errors and omissions despite every effort by a great many people (including the P. and T. Department).

Addresses and other details, for WIA members, some 7000 of them, will be correct up to 1st July, with only a dozen or so exceptions. It was not possible, in a publication of this nature, to indicate who are members and who are not. Dissemination, amongst Divisions, of computer printouts, takes care of this. These printouts are provided in call sign, alphabetical, postcode, grade and other formats for both members and non-members and include details of financial status as well.

Thanks to most valuable co-operation from the Department the call sign lists back to 1978 have been incorporated into the WIA computer file. Earlier than 1978 the degree of error and omission increases as the Editor discovered after distributing the 1977 edition. It is known that some 300 non-members' addresses were not correct in October last year because this was the quantity of WARC 79 Fund Appeal letters which were returned to the WIA address (etc.) unknown. A few of these have since been corrected, but unless non-members or their friends send their call sign details to the WIA Executive office there is no way to ensure accuracy.

According to the computer totals there are nearly 13,000 entries in the call book listings. These are on the WIA's file which produced the call sign lists. The full list was processed on to a computer tape which was used by Valentine Computer Services in Melbourne to produce, by phototypesetting, bromides ready for the printer. The phototypesetting machine, a Photon, uses one of a selection of type founts, in conjunction with the data on the computer tape, to feed the information through a display tube direct on to bromides ready for immediate use. Whatever is on the computer tape is printed out photo-electrically in a few minutes. The speed of such printing seems to be in the order of nearly 1000 lines of call sign data per minute and is greatly superior in quality to ordinary computer printouts of the kind used for the 1977 Call Book.

To ensure the success of this operation a great many tests had to be made beforehand to achieve compatibility for a particular end-purpose. Thanks must go to both Valentine and the Monash ADP centre for their advice and patience during these tests, as well as the printers for valuable advice and assistance in proving the systems along the line.

Little details of all kinds posed problems. An early sample of phototypeset bromide was produced with only 1 pt. of spacing between lines. This made it hard to read each line so a wider spacing was settled on. But a wider spacing reduces the number of lines on each finished page and when you are looking at a web offset print you have to think in terms of 8 or 16 page plates for the final product.

Similarly a close look was made of line lengths. It was eventually possible to keep these down to no more than 80 character spaces. This is a function of the computer programme itself as well as the way in which separate parts of the data are separated from each other. As examples, how much space between the call sign and the person's name and between the name and the address.

Input of information on to the WIA computer file is done monthly — it is, by comparison, a very small file; many experts have said the file is too small for computer work! However, the file takes care of 4 main functions: The Call Book, AR address labels, subscriptions listing and production once a year of subs notices and listings of member (as well as non-members) for everyday use at the Division and Federal levels.

Back to the 1979 Call Book from this digression. The phototypesetting used the smallest type face fount available but even this was found to be too large to fit two columns on to a finished

ADVERTISERS' DONATIONS TO WARC '79

The Federal President wishes to extend grateful thanks to our advertisers for generous donations towards the expenses of WARC representation

MARCH 1979	$
Dick Smith Electronics	500
Vicom International	1000
Bail Electronics	500
Chirnside Electronics	100
Scalar Industries	50
Elmeasco Instruments	25

These are entitled to the use of the WIA emblem and the words: "WARC Amateur Supporter" in their advertising displays.

page without photo-reduction by the plate-maker. Naturally the editor wanted characters as large as possible. Only one column per page would have involved a book containing many more pages than the 1977 edition because of the increase in numbers since then. Options were examined and rejected — smaller pages, cross-wise printing instead of vertical, thinner paper, and so on. Costs had to be kept in mind all along the line. A 10,000 run is not cheap in any language.

A small photo-reduction was eventually agreed on in order to fit two columns on to each page of the existent size, which seems to have found favour by users in recent years. Those who have seen photocopies of a sample of the finished product agree it is readable except by anyone with very poor eyesight. Furthermore, the line format is much preferred to the 1977 edition. The character size is larger than the one in the International Call Books, is similar to that in the UK Call Book and slightly smaller than the type in the ZL Call Book. It might have been even better if upper and lower case could have been used. That is something for the future because it affects the formatting of the computer output itself. Changes to computer programmes cost money even if any particular facility can be provided.

Anyway, most users of the WIA Call Book will surely approve this presentation as an improvement. Constructive comments would be welcome. Indeed, many such comments were taken into consideration after the last edition and will be needed for any bigger and better 1980 edition.

Finally a reminder to members. Please promote the WIA Call Books. It is your money backing them. Dust gathering on unsold stocks earns no money. Up to date, no dust has gathered because there are no unsold stocks of past Call Books — and Magpubs books either, come to that.

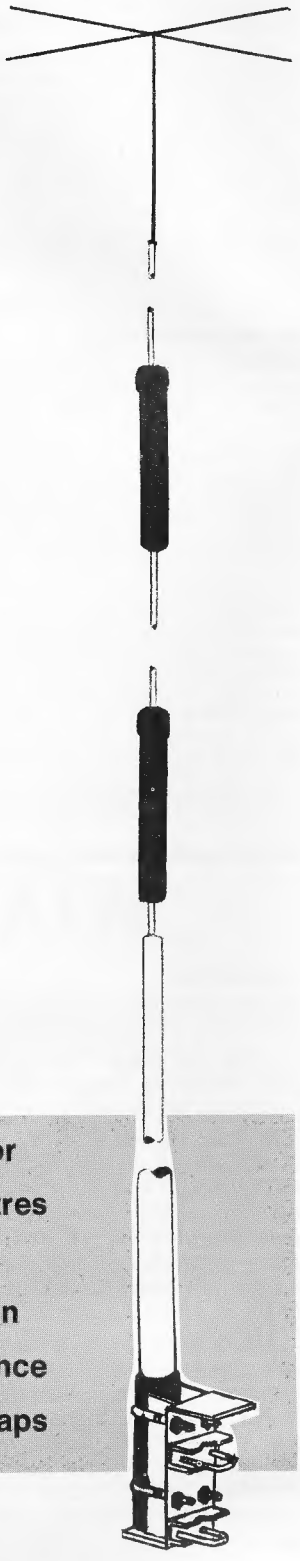
It must be confessed, however, there are stocks (not excessive) on hand of old ARs despite every precaution to keep print runs down to the barest minimum. Some months many copies go astray in transit and have to be replaced: Sometimes there are collating errors — half the pages are missing or duplicated: New members in greater than usual numbers (or unfinancials becoming financial) use up the "overs": All these happenings mean you cannot merely print enough only for the quantity of address labels. For some months, since 1972, there are no spare copies on hand, for others there are still stocks on hand — good material for recruiting hand-outs.

MEETINGS

There was one meeting of the Executive during July and one meeting of the Publications Committee. A decision was made to increase the "cover price" of AR from 1-1-1980 to $1.20 per copy

SC22DX

Scalar's Great New 5 Band Vertical



FEATURES:

★ ¼ wave operation for
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★ low angle of radiation
★ for top DX performance
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in place of the present $0.90. Basically this affects only direct subscribers, namely overseas readers and local organisations such as Government Departmens, libraries and schools. At the same time a modest increase in advertising rates was agreed; the last increase was in 1975.

EXAMINATIONS

The Victorian Division put forward an interesting proposition that for the purpose of examination exemptions the morse code section should be split into sending and receiving. Thus, any candidate obtaining a pass in, for example, the sending test would only be required to sit for the receiving part at the next examination.

PHOTOGRAPHS

Photographs of amateur subjects are still urgently required for AR.

WARC 79

The all important World Administrative Radio Conference (General) relating to the future of the entire frequency spectrum throughout the world opens later this month. Everybody wishes all amateur delegates and observers at this Conference every success, and in particular the WIA delegates included in the Australian delegation, the Federal President, Dr. D. A. Wardlaw VK3ADW, and the WIA IARU Liaison Officer, Immediate Past Federal President, Mr. M. J. Owen VK3KI.

The Executive wishes to acknowledge with grateful thanks the receipt of the following donations from members towards WARC 79 expenses —

LIST No. 5

VK3ALG	*$3.00*
L50355	*6.25*
VK4ABG	*2.95*
VK3FH	*10.00*
VK3VG	*5.00*
VK3DS (per AR Ltd.)	*50.00*
VK3ADY (per AR Ltd.)	*10.00*
WIA Tasmanian Division NW Branch (per VK7ZOA)	*22.00*
VK2NSA (per Hunter Br.)	*5.00*
VK3BJP	*25.00*
VK3 Fox Hunt Group	*30.00*
VK2NUK	*20.00*
Geelong AR-TV Club (per VK3CM)	*76.00*
VK4ZBI	*5.00*
VK4DW	*10.00*
VK3BRI	*10.00*
VK5 Division (per VK5HI and includes one anonymous donation of almost $900 in memory of the work that the late John Moyle made in 1959 to the Amateur Service at a similar WARC). Includes donations from: VK5FG, VK5AMS, VK5KL, VK5WA, VK5XA, VK5FM, VK5SS, VK5NMQ, VK5HT, L50442, VK5VE, VK5MY, VK5ZAP, VK5JG, VK5EN, VK5RK, VK5NBD, L50363, VK5BN, VK5WP and VK5NL	*1251.60*

It is understood further donations are to be expected via Divisions. ■

Have you sent in your Log Sheets for the

RD CONTEST?

NOTE: You MUST include a Front Summary Sheet as per Rules in July AR, p. 41.

QSP

COMPUTER SHOW

Melbourne's first Home and Small Business Computer show will be held in the Exhibition Buildings from 27th to 30th September, 1979, according to a media release from Australian Seminar Services Pty. Ltd. Resulting from many requests at previous shows, the theme of this show has been expanded to include all small inexpensive computers. ■

CADMIUM POISONING

An item in Pat Hawker's TT in Rad. Comms. June 1979 draws attention to the potential risks of cadmium poisoning by ingesting or inhaling the "woolly" white powder (cadmium salts of organic acids) which sometimes appears as a deposit on cadmium-plated metalwork (screw heads, switches, etc.) in electronic equipment. Take reasonable precautions, he recommends, to remove any such deposits which are due to corrosion — use gloves and swabs damped with water to wipe away all corrosion products. Place these and the gloves in a plastic bag and burn them. ■

SUNFIRE PROJECT

"For over 8 years and at their own expense, High School students living in the vicinity of (the Jet Propulsion Laboratory, Pasadena, California — W6VIO) have worked together to construct a Solar Thermal Electrical Generator for use on Pitcairn Island. These young boys and girls, some of them amateurs, expect to complete the project this month (June) with the generator ready for shipment." "All told the generating system will weigh in at about 11 tons and be able to supply between 5 and 8 kW of power." All that remained to be done was the installation of the 240 individually adjustable mirror facets, the boiler at the point of focus and the generator operated by a steam engine. "The boiler is heated by the rays of the sun focussed on it from all points of the parabolic cylindrical section solar collector." After that money some means must be found to transport and install it on Pitcairn Island.—CQ editorial June 1979. ■

GENEVA ITU EVENTS

WARC 79 opens in Geneva on 24th September. Two other events in Geneva during September as organised by the ITU will be Telecom 79, the third of such World Telecommunication Exhibitions, from 10.00-18.00h 20th to 26th September (entrance fee Sw. fr. 10) covering 70,000 sq. m. for nearly 600 exhibitors in 40 countries, and Forum 79 in two parts — Part 1 from 10th to 21st September, covering telecommunication perspectives and economic implications, and Part 2 from 24th to 26th September in two parallel sessions, covering technical matters. Travel arrangements are being handled by American Express. ■

EMERGENCIES

According to Ham Radio June 1979 the volcanic eruption on St. Vincent essentially destroyed conventional communications throughout this Caribbean island. Amateur radio immediately filled the breach when several VP2s set up a communications centre at police headquarters. Requests for help from the Island's Premier were passed through to Miami via amateur radio, resulting in immediate relief assistance. A request was also relayed to the FCC for third party traffic handling facilities — this was granted in under two hours. ■

2GB AMATEUR RADIO ANNIVERSARY ON 873 kHz

One year has passed since the first amateur radio propagation report was broadcast over 2GB radio.

Three times each night seven days a week for the last year amateur radio enthusiasts have provided the station with the latest radio conditions and news of interesting club meetings and events.

Broadcast after midnight, 1 a.m. and 2 p.m., any listener able to tune into at least one amateur band is able to volunteer to phone a report into the station at least once a week at 10.30 p.m.

If you would like to promote amateur radio to the listening public in this way then contact Sam VK2BVS on phone 407 1066 between 7 and 9 p.m. ■

CURRENT SINK

Denzil Roden VK2BXF
7/169 Herring Road, North Ryde 2113

Designs for DC power supplies of various current capabilities, appear frequently in amateur publications. Constructors often have trouble providing loads in order to test the regulation throughout the design range. This item of test gear provides a solution to such problems.

Though having originated, in principle, during the valve era many years ago, the circuit has apparently not found its way into amateur handbooks. The idea is simple and can be built temporarily to test a "one-off" supply, or is ideal as a club or group project.

The SUPPLY terminals of the load are connected to the corresponding output terminals of the supply to be tested via, if required, a test ammeter. A variable voltage, set initially to zero, is connected to the DRIVE terminals.

With the drive voltage at zero, the load transistors are all turned off and only a few microamps of leakage current is drawn. As the drive voltage is carefully increased, the transistors are proportionally turned on, until the required load current is obtained. With six 2N3055s a drive voltage of about 1.8V will input some 500 mA to the paralleled bases, loading a 13V supply to about 20 amps. A limit of round about 4A collector current per 2N3055 should be observed.

The maximum drive voltage (Vbe) for a 2N3055 is 7 volts, but even as much as half this value is unlikely to be required. The source of drive voltage should be fairly smooth, a lab type bench supply is ideal, any undue ripple on the bases will modulate the load current.

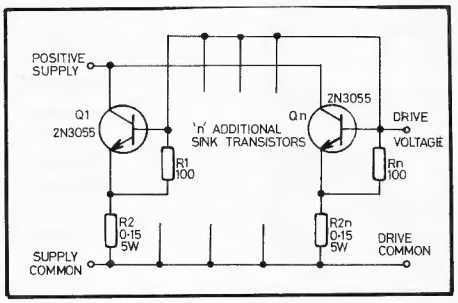


FIGURE 1: Current Sink Circuit. 100 ohm resistors are ¼ watt carbon, 0.15 ohm resistors are 5 watt wire wound IRH ASW5. Transistors should be insulated with mica washers and smeared with silicon grease.

The 0.15 ohm resistors equalise the bias of the transistors, ensuring equal current sharing, they are IRH type ASW5, obtainable from the more professional component suppliers. Otherwise they may be fabricated from resistance wire; electric heater elements are suitable.

The number of transistors may be reduced where lower maximum current capacities are required.

All components can be mounted on the heatsink, with help from a few tag strips. The heatsink should be large enough to dissipate the heat generated, 260 watts for 20 amps at 13 volts, with proportionally smaller heatsinks for lesser powers. Suitable heatsinks can be obtained from Davred Electronics.

A silicon transistor is "too hot" if its case will boil a drop of water placed on it (rule of thumb, or in this case "finger"). If the heatsink is not up to the job, it may be assisted with a forced draft from a fan or from the delectable YLs hair drier.

Wiring should be capable of carrying the currents involved, otherwise the full capability of the regulator will not be realised. Collectors and the common ends of the emitter resistors should be bussed, each bus is made with two parallel lengths of 14 B and S tinned copper wire, supported at the ends of the heatsink on tag strips. The busses both carry the full load current and each collector and emitter connection should be able to cope with 4 amps.

Rather than use a heavy multi-stranded wire such as 100/0076, with which it is difficult to produce neat soldered terminations, the writer uses up to four smaller wires in parallel, giving the same total current capacity but resulting in a tidier job.

With regard to test measurements, erroneous results can easily be obtained, so take care that connections made are adequate and do not introduce unnecessary contact resistance. It pays dividends to make proper connecting leads with suitable terminal lugs. If a current meter is included in the test circuit, allowance should be made for its internal resistance and its resulting voltage drop, e.g., an AVO Model 8 multi-meter used on its 10 amp range drops about 0.9 volts at Full Scale Deflection, while with additional current shunts, lesser drops will occur. ■

TOROIDAL BALUNS

K. Curle VK2OB
24 Beach Drive, Woonona 2517

Practical information about making ferrite-cored toroidal baluns. The details should apply to almost any antenna that can be fed with a balun. Experiments at this QTH were all with quads but of many shapes and sizes.

It is essential when winding a toroidal balun to know the impedance you are trying to match and I would recommend that you beg, borrow, buy (or build) an antenna impedance bridge.

A quad driven element that is over ½ a wavelength from the ground will vary in impedance from about 55 ohms with a .1 λ spacing to the reflector to about 115 ohms with a .2 λ spacing. The director makes negligible difference. The main problem is that proximity to trees, rooftops, etc., as well as other closed loop elements in multi-band quads, all vary the impedance.

It is best, I have found, to have a minimum of 10 turns on the primary winding and most ratios can be made close enough without exceeding 15 turns on the primary. For ease of adjustment the two secondary windings should be wound on first — they must have the same number of turns and I always make them one continuous winding with a large loop halfway that can be snipped later. This keeps the windings intact and also saves the sharp ends from piercing your hands when winding the primary over the top.

To calculate your turns proceed as follows —

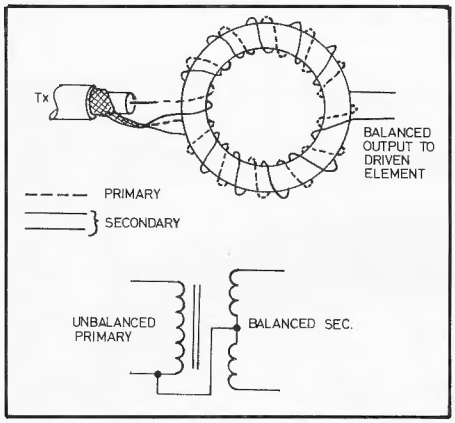
If your impedance is, say, 98 ohms and you want to feed the antenna with 50 ohm coax the ratio of these impedances is 1.96 to 1. As with any close-coupled transformer the turns ratio is the square root of the impedance ratio, thus in this case 1.4 to 1. Then as it is essential to use about 10 turns on the primary the secondary turns would be 14. This means that we would win 10 turns on the primary and 14 on the secondary in the form of two 7 turn windings.

If you have to guess your impedance it is best to leave a couple of extra turns on the primary and check your SWR as you remove them half a turn at a time. If you are working off a ladder or the roof it is wise not to try for a 1 : 1 SWR as it will change when the antenna is at full height.

There are probably many good ferrites available. The one I use is the Mullard FX1588, which is excellent at HF. It does seem to be "running out of steam" at the top end of 10 metres, but results are still good on this band. Wire is not very critical, 14 SWG is what I have used and found that it wraps around the toroid without springing off and slipping. If you use wire from an old transformer heater winding the enamel may not provide adequate insulation, and I would suggest that you layer plastic tape over the secondary before winding the primary.

Once you are happy with the matching, the balun can be coated with silicone rubber or in my case (I have a beach frontage) encapsulated in epoxy resin.

I have run 350 to 400 watts PEP through these baluns without melting candle grease poured on them as temporary moisture shields. I don't know what power they will take, but they will handle any legal amateur power.



SOME EXAMPLES (Turns are practical figures)

Coax	Impedance	Impedance Ratio	Turns Ratio	Turns Primary	Half Secondary
50	50	1:1	1:1	10	5 each
50	75	1:1.5	1:1.2	10	6 each
50	84	1:1.68	1:1.3	14	9 each
50	100	1:2	1:1.414	14	10 each
75	200	1:2.67	1:1.63	11	8 each
50	200	1:4	1:2	10	10 each

LEFT: FIGURE 1.

EARS FOR THAT DEAF FT101B RECEIVER

C. H. Castle VK5KL
29 Turnbull Road, Enfield, SA 5085

How many times have you heard on the air the remark "my FT101B is a little deaf"? My own unit was not deaf but its performance was well down compared with a Drake RC4. Not now!

Always looking to improve the performance, the usual modifications published were tried and found wanting. Determined to find a way, it was decided to improve the signal between the 3SK40 RF stage and the antenna input. No claim is made for the originality of the circuit as shown, but the initiative to wire it up and try it.

The prototype was built on a piece of vero board, 11 x 23 holes, and laid out as Fig. 1.

The vero board is mounted on the top of PB-1181-B by attaching it by four wires to the earth rail and the earth of the PB-1181-B board, as per Fig. 2.

Take the PB-1181-B board out from the FT101B and withdraw the 3SK40 RF stage transistor from its socket for safety.

Lift the end of the 100 pF capacitor C1 that connects from pin 8 to gate 1 of the 3SK40 at the gate 1 end and run a wire from the capacitor to gate 1 of the MPF121. On the opposite side of the board connect a wire from gate 1 of the 3SK40 to the 100 pF output of the BC308. Also connect a wire from pin 14 to the plus input of the added board. Replace the 3SK40 in its socket and replace the board in the FT101B. You may have to re-align the receiver circuits on 28 MHz A, B, C and D. On the other lower frequency bands the pre-selector tuning will take up any difference. If not, re-align all circuits as per instruction manual. The extra gain will

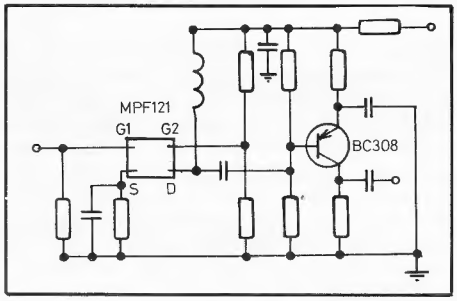


FIGURE 1: Component layout.

mean the "S" meter will need to be adjusted at 14200 MHz as per instruction manual.

If, when you replace the board and switch-on, there appears to be an intermittent fault such as "crackling" or "popping" noises when the board is touched or moved, check the lead between C1 and the gate of the MPF121. Where the lead leaves C1 it passes between two resistors and a capacitor. Part these components so that the lead is clear, does not touch them, and is kept well down near the surface of the board. This should cure the slight regeneration which causes these symptoms.

(Note: The circuit as originally submitted by 5KL showed a resistor across the MPF121 drain coil. Correspondence with the author indicated that this was one of the measures tried to reduce regeneration, but later proved unnecessary. Possibly a higher than normal gain FET may require a resistor here in the order of 220 ohms to 1k.—Tech. Ed.)

In my case, due to the extra gain I find that on 3.5 and 7 MHz the RF attenuator can be used to reduce the gain to that of the other bands and it aids the selectivity on these two bands.

Now sit back and notice the new sensitivity of your receiver and how the signals stand out above the noise level.

Good luck with the modification — Clarry.

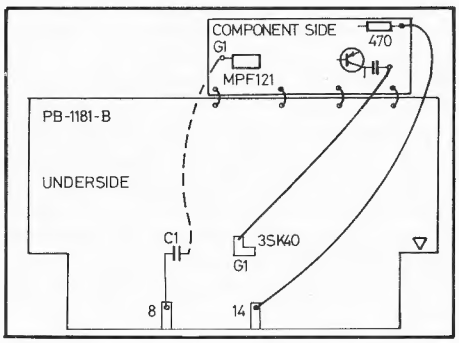


FIGURE 2: Connection diagram.

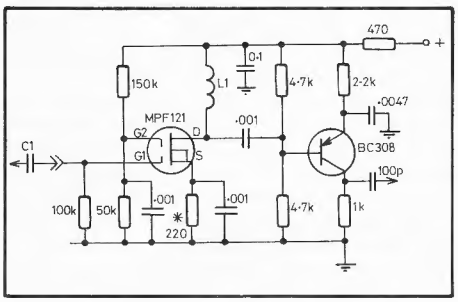


FIGURE 3: Circuit diagram.

L1, 8 turns nylon coated jumper wire close-wound on 5/32 in. dia.

* Can be varied from 220 to 1k ohms. The higher value will drop the gain slightly but aid selectivity. ■

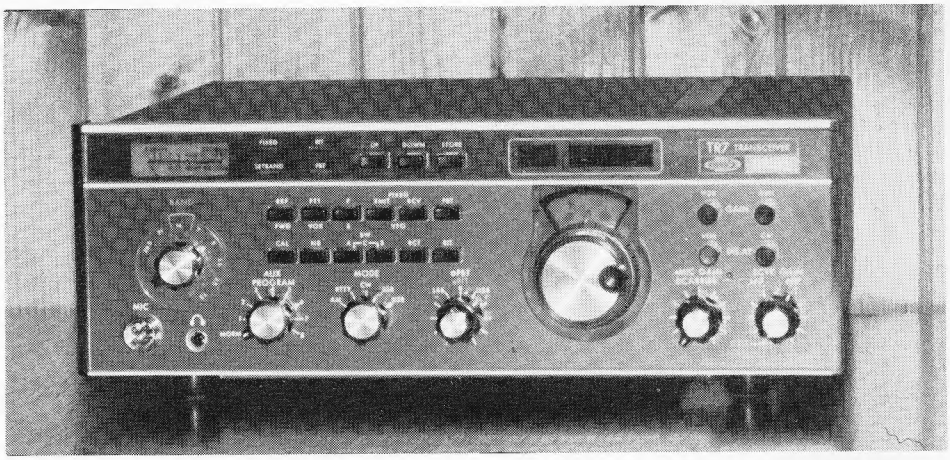
REVIEW: THE DRAKE TR7

Stephen Garner
27 Neerim Rd., Castle Cove 2069

This article is a departure from our normal equipment reviews. Firstly it is not written by our usual reviewer. Secondly it is not a solicited article and we must accept that the author did not have available the sophisticated test equipment required to check the manufacturer's claimed technical performance. The article, nevertheless, does cover the apparent strengths and weaknesses of the TR7 quite well. Even if you are not about to buy a new rig this article makes interesting reading.

The R.L. Drake Co. have recently released their latest HF transceiver, the TR7. This radio is to supersede their old TR4 series and possibly the T4, R4 series of separate transmitter and receiver (the "Twins". The TR7 has taken off very well in the States where at the moment there is a six to eight month waiting period for delivery.

The TR7 with DR7 option (Digital Read-out), TR7/DR7, is the model most Australians will meet, so comments will be restricted to this model.



FREQUENCY COVERAGE

The frequency coverage of the TR7 is the first point of interest. On receive it is a 1.5 to 30 MHz receiver. On transmit it covers all the Ham bands 160 to 10 metres in 500 kHz sections. With the addition of the optional extra, AUX 7, the TR7 enjoys 0 to 30 MHz receive capability, and it can transmit in an extra 8 500 kHz sections which may be placed anywhere from 1.5 to 30 MHz. Alternately the frequency can be crystal controlled, which is probably of some use in commercial applications. So the TR7 will easily handle any extra band allocations, unless WARC 79 gives amateurs more than an additional 4 MHz in the HF band.

The TR7 has a built-in frequency counter which gives a digital display of the operating frequency and can be accessed externally to provide an accurate counter for work around the shack. The unit will count up to 150 MHz which makes it useful for work on VHF as well as HF equipment.

FRONT END DESIGN

The TR7 achieves its frequency coverage capability by a radically new design approach. Most amateur HF transceivers use a single or double conversion technique to get to an IF of between 5 and 10 MHz, where a crystal filter provides the selectivity. The TR7 has broken away from this idea to a new method Drake term Up-Conversion. That is, the signal is converted up to a first IF of 48.05 MHz and then down to 5.645 MHz, where an 8 pole crystal filter provides the selectivity. By this method, Drake are able to provide a 0 to 30 MHz receiver, with no IF gaps, that has the performance of a good amateur transceiver.

As Drake point out in their advertising brochures, it is only with recent developments in solid state techniques that transistorised equipment has been able to meet or exceed the performance shown by that using valves. The area where solid state equipment has failed in the past is in the ability to handle strong signals near to the desired frequency. So the specifications for Dynamic Range and more importantly Intermodulation Distortion (IMD) are rarely quoted by the manufacturers. Rather they are only too willing to tell of the excellent sensitivity of their equipment, an area where transistors excel.

In an effort to provide a "strong" front end, the first active element in the TR7 is a double-balanced mixer with a high level of local oscillator injection. This connects to a 4 pole crystal filter 8-10 kHz wide, then via a second diode ring double-balanced mixer to the information filter, which for voice is 2.3 kHz at 6 dB down and 4.1 kHz at 60 dB down. It is only here, after the selectivity, that Drake place the bulk of their gain.

As a result of this design Drake are able to quote figures for Dynamic Range and IMD of 95 dB and +20 dB respectively, two very impressive figures. None of the figures quoted have been verified by the author but one would hope that even in modern times manufacturers can be trusted to this degree. There is, however, a necessary trade-off between Dynamic Range, IMD and Sensitivity. Consequently Drake are only able to claim a sensitivity figure of 0.5 uV for SSB. This comparative lack of sensitivity would not normally be a problem as background noise is usually above this figure, but conceivably there could be circumstances where this lack of sensitivity would be a hindrance.

ON AIR TESTING

The TR7 was connected "back to back" with the Drake Twins and then to a TH6DXX at 90 feet. Unfortunately on the evening of this test the bands were not very crowded and neither set could be faulted under strong signal conditions.

On weak signals, the audio quality was superior on the Twins while the TR7 appeared to have less background noise. If there was a difference between the two, the TR7 appeared to have a slight edge in hanging on to the weak signals. The difference in audio quality was probably due to the fact that the Twins were used with their matching speaker and the TR7 has a narrower filter and more extensive audio filtering to cut out the "highs".

The results were repeated when the TR7 was run back to back with a Kenwood TS820S at VK2MB, the Manly Radio Club. Once again there were no strong signals on the bands. Under weak signal conditions, however, the TS820S was able to demonstrate its superior sensitivity, being better at pulling signals out of the mud. The audio quality of the TS820 from a hi-fi point of view was superior to the TR7. The narrower filter of the TR7 and audio characteristics definitely make it a communications transceiver rather than one for enjoying the individual's voice in local "rag-chews".

The big test came later when the TR7 was used during the CQ WPX contest. Conditions were good and the bands were crowded with S9+ signals. Here the TR7 really proved itself, and after 4 or 5 hours behind the VFO one could almost feel the crystal filter reaching out into the night.

Not once was there a trace of any signal outside the passband of the filter being received, no cross modulation or IMD.

The TR7 does have a problem with spurious responses. This is probably due to a number of factors; the set is synthesised, it is a continuous coverage receiver, it uses up-conversion and uses high levels of local oscillator injection (typically + 17 dBm). There are a large number of spurious signals throughout their receiver range, including the ham bands. However, there was only one spurious signal found that moved the "S" meter, and this at 5.645 MHz was S9. These are certainly a nuisance but it is doubtful if they would ever stop a contact being made. The most annoying feature is that they sound like a weak DX station tuning up on air, and one is constantly switching between antenna and dummy load to determine if they are DX or a spurious signal.

TRANSMITTER

The TR7 is solid state throughout, including the PA, which is rated at 250 watts input. The output power was measured and found to fall from 130 watts on 14 MHz to 100 watts on 28 MHz, which means the amplifier is fairly inefficient. This is probably true, because as it is broadbanded, Drake have used linear techniques throughout in order to keep the transmissions clean. The amplifier chain is all class A except the driver and final. The transmitter is supposedly capable of running "key down, flat out" for 5 minutes, unless an auxiliary fan is fitted, when it is then capable of continuous use. In order to test this the CW key was shorted and the rig left to run for 5 minutes at 130 watts output. The TR7 was easily up to the task, the heatsink was just warm, which is more than could be said about the dummy load.

OPERATION

The operation of the TR7 is extremely simple. In fact the absence of knobs and dials to fiddle with is at first almost frustrating. There is absolutely no tune up on receive or transmit. Power output is continuously variable on both CW and phone.

In fact the rig is almost completely automatic. All that needs to be done is to select the frequency and push the button. Even the AGC decay times are changed when the modes are changed; this can then be further altered by a front panel control.

The transceiver is very flexible. It is possible to select any of 4 filters (2.3 kHz is standard, 300 Hz, 500 Hz, 1.8 kHz and 6 kHz are optional) independently of the mode in use, thus one can receive CW through a 300 Hz filter and transmit voice. By use of the Pass Band Tuning, PBT, it is possible to receive on a sideband and transmit on the other. All interesting features but probably of little practical value.

The PBT is a useful feature in the fight against QRM. It moves the received signal with respect to the information filter and then moves it back on frequency in the product detector. Thus the received frequency remains unchanged while the QRM is antenuated by the crystal filter. In a test, two signals, 200 Hz apart and both S9+, were injected into the receiver. By use of the PBT one signal was reduced to an S1 while the wanted signal was unaffected.

CONCLUSION

A number of quick points in conclusion. The TR7 does not have a notch filter, which seems a pity. The hand book basically gives very little information apart from instructions on operating the rig and a basic overview of the theory of operation. It badly lacks a circuit diagram or any servicing details apart from advising that it should be taken back to the dealer should any problems arise.

The TR7 is an expensive rig, but for the amateur who wants the best and is prepared to pay for it, it is worth looking at. The TR7 is not for the ham who only wants to talk to the locals, other rigs available will do the job as well and cheaper. The TR7 comes into its own, however, in crashing dogpiles, in kilowatt alley on 20 metres, or on 40 metres where the IMD from ½ megawatt short wave broadcast stations near in frequency can render a receiver useless in certain QTHs.

The R.L. Drake Co. have certainly produced a technically interesting transceiver in the TR7. It will be interesting to see if other manufacturers of amateur equipment follow Drake's lead in up-conversion and strong front-end design. ■

NO-BREAK CLOCK SUPPLY

Jim Jones VK8ZJJ

Having lived in areas where the mains are somewhat erratic, I found it necessary to construct a simple no-break supply. This circuit overcame the problem of having to reset the station digital clock every time a mains failure occurred.

INTRODUCTION

A no-break supply is a system in which the supply is normally taken from the 240 volt mains. In the event of a mains failure, the supply is automatically switched to a standby battery source. When the mains voltage is restored, the system automatically switches back.

The circuit is extremely simple and can be adapted for many other applications.

OPERATION

The operation of the circuit relies on the basic fact that a diode will conduct when the anode is positive with respect to the cathode and has the appropriate forward bias. A silicon diode requires approximately 0.6 volts.

Two diodes are used to isolate the supplies. The output to the clock timing circuit is always the higher of the two input voltages. To operate correctly, the voltage from the main supply must be higher than the battery source. If not, the batteries will become the main source for the clock timing circuit.

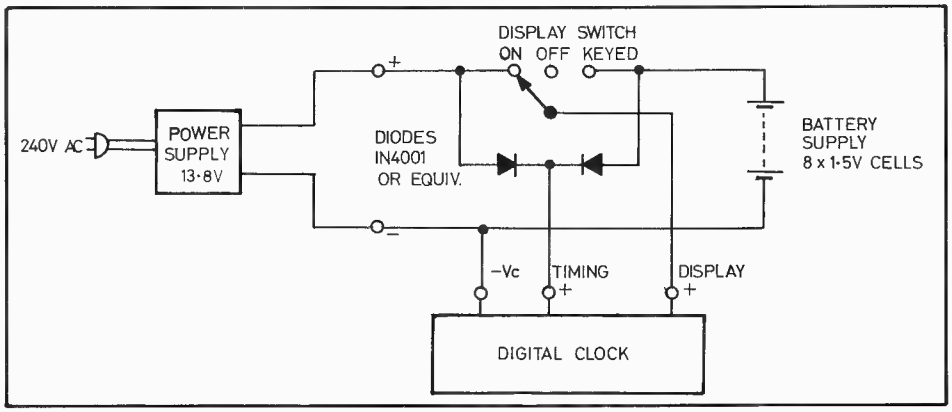


FIGURE 1: Circuit diagram.

A key switch has been included in the clock display circuit.

This switch enables the display to be switched on continuously from the main supply, switched off or keyed-on from the battery source. By utilising this facility, the battery life will be extended. In this circuit, the batteries are *not* charged by the main supply.

CONCLUSION

As many of the quartz clocks available have good long term stability, it is advantageous to have a clock supply which has long term voltage availability. ■

160 METRE BAND DX

The late Art Berry VK3CZ

The latter day pioneer of this band, Jack de Cure VK5KO, has been an inspiration to myself and other 160m DX fiends. This article covers some of the aspects of DXing on this band.

My primary interest is DX and the propagation conditions that make DX possible. Real DX is generally only possible when the most Eastern station is calling at his sunrise time. Even then contacts are possible only at certain times of the year when exceptional conditions occur. It is therefore necessary to keep regular vigils at suitable times — the contacts may be few but are both exciting and rewarding.

The receiver used should have excellent selectivity as the 160m band is narrow and, when the Americans and Japanese are coming through, so are the local VKs. The AR88 used here was fine with regard to selectivity but was not nearly selective enough. Nevertheless it provided me with WAC, starting in 1971 and being completed in 1973. The mode used was CW.

What sort of DX can be worked? Well I have been exhilarated by contacts with America and Africa but my most exciting 20 minutes on 160m occurred on December 31, 1973, when the following stations were worked reporting my RST as shown. Times are in GMT (now UTC — Ed.).

Time	Call	RST
1858	OK1ATP	479
1904	G3ZEM	579
1907	G3XVY	579
1911	G3YUV	579
1915	EI8H	579

QSOs with OK1, 5Z4, ZE7, OA8, GM3, VP8, LU5, KL7, VE5, PAO and many W and JA stations have been enjoyed on this band.

Is high power necessary? Apparently not, as G3TR was contacted with only 10 watts used at his end.

Suitable antennae include inverted Vees and verticals. I use a long dipole at 50 feet.

What time should you listen? Europeans are best heard here at dawn during December, January and February. Africans are heard at the same time in June and July. South Americans appear at dusk here in June, July and August. North Americans are heard in the early to late evenings and the Japanese are also audible in the evenings.

Tune 1800 to 1810 kHz for the North Americans, South Americans and the Africans, 1907.5 to 1912-5 kHz for the Japanese and 1825 to 1830 kHz for the Europeans.

Some of the signals are surprisingly strong with many W stations running to S9 plus. Conditions are not as good now as in 1971 to 1974, but good contacts are still to be had. Other amateurs, such as VK6HD, have recently made WAC on 160m so why not you?

(Art was also something of a pioneer on this band having attained what are believed to be the first VK-VP8 and VK-LU5 QSOs on 160m — Ed.) ■

TRY THIS

WITH THE TECHNICAL EDITORS

RUSSIAN 28 MHz DIRECT CONVERSION RECEIVER

Due to the upsurge in the solar cycle and the Russian Amateur Satellites several 28 MHz band construction projects have appeared in the Russian magazine RADIO.

One of these projects is a simple direct conversion receiver using an interesting type of balanced mixer. The balanced mixer was described some time ago in Radio and uses the unusual combination of parallel reverse connected diodes and oscillator injection at half the frequency.

The circuit is shown in Figure 1 and the printed circuit board layout is shown in Figure 2. These are reprints from Radio for December 1978.

No equivalent or coil details are shown due to the difficulty of obtaining exact equivalents. Construction should be possible by experienced constructors able to choose suitable local components. The coils used were similar to the local Neosid and the low pass filter used a small audio toroid. The diodes V4 and V5 are low capacitance types with approximately 1 pF at 0 volts.

In the circuit of Figure 1 the RF amplifier is V1 which is an FET. Audio AGC is applied to this stage by the AGC diodes V2 and V3. L1, C2, L2, C3 form an input filter.

The output of the RF amplifier, tuned by L3 and C8, is applied to the balanced mixer made up of diodes V4 and V5 in a parallel connection with reverse polarity. The local oscillator being applied by C9. The local oscillator is on half the operating frequency and in this case is in the 14 MHz region.

The local oscillator is a fairly simple circuit using V6 with supply voltage stabilised by V7, which is a Zener diode. The oscillator tuned circuit L4, C12, C13 is on 14 MHz. Capacitor C13 of 2-7 pF is the tuning capacitor. A small air spaced variable would be suitable.

The output from the mixer passes through an audio low pass filter made up of L5, C9 and C10. This uses an inductor wound on a small audio ferrite toroid. The cut-off should be 2 to 4 kHz to allow reception of SSB.

The audio amplifier is quite straight forward. The only quirk being resistors R7 and R11, which are adjusted on test. This will apply in any case as direct equivalents are not obtainable locally.

The circuit of Figure 1 uses a mixture of Russian letters and Roman letters, e.g. a capacitor marked C20 47.0 x 15B is really a 47 mF 15VW capacitor.

The circuit board used in the original measured 140 mm by 50 mm. The circuit details appeared in Radio, issue 12, 1978. The author was V. Polyakov RA3AAE. ■

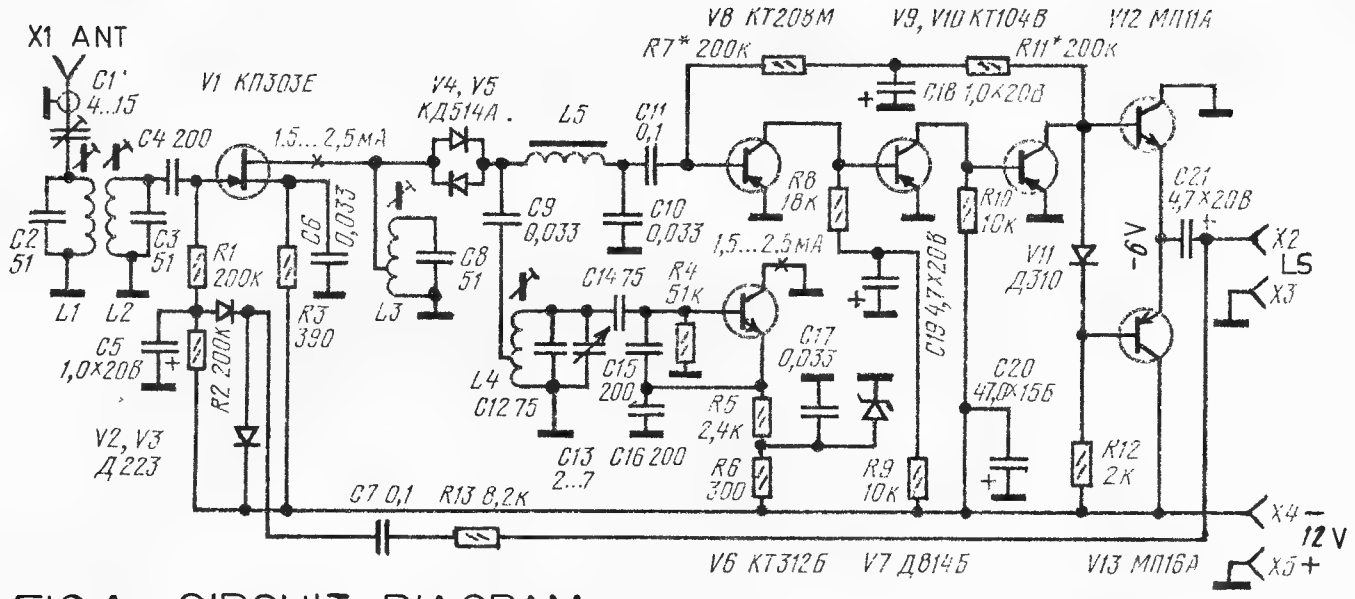


FIG 1 CIRCUIT DIAGRAM

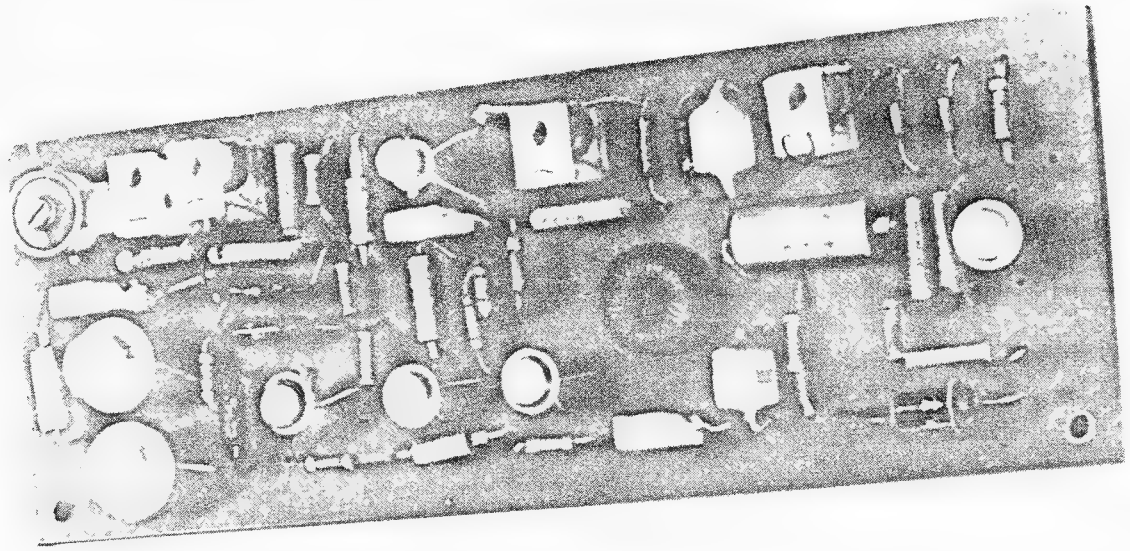
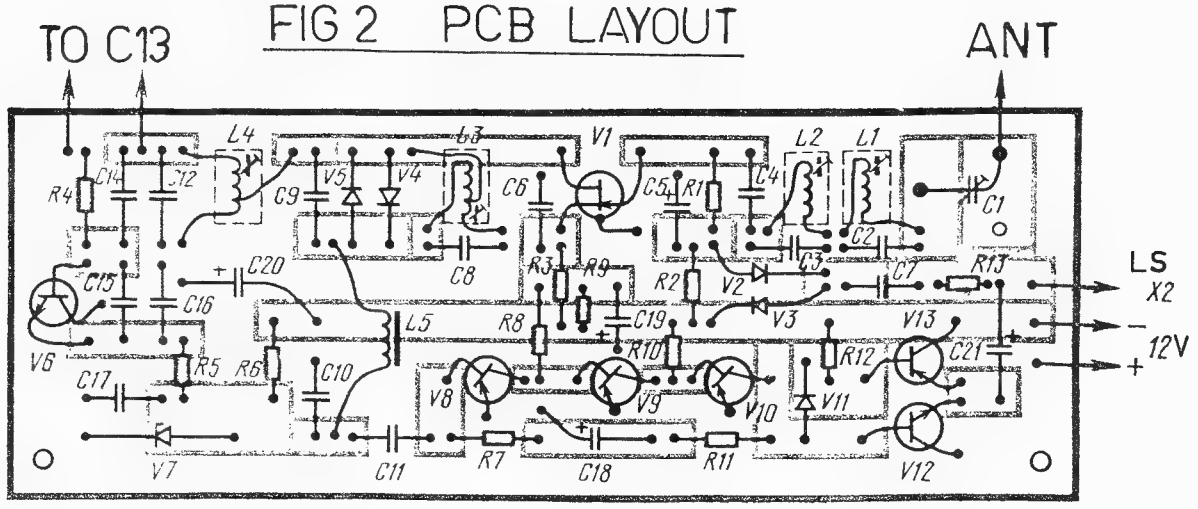


FIG 2 PCB LAYOUT



THE NEW WORLD-WIDE CRAZE OF 10 METRES FREQUENCY MODULATION

Sam Voron VK2BVS
2 Griffith Ave., East Roseville, NSW 2069

Now, with both frequency modulation and channeling techniques available on 10 metres, enjoy the same type of low-noise communications so popular on 2 metres and up — but with the excitement of DX. If you've been missing the fun and excitement of local, national and DX contacts on the high end of 10 metres, let us correct the situation at once. This is the mood of 10 metre FM, recently captured by a US marketing firm promoting the first of a new generation of 80 channel 10 metre FM mobile transceivers.

Faced with the question of how to utilize the top end of 10 metres, in such a way that increased amateur occupancy, many efforts over the last 20 years have failed to stir any interest.

Faced with a wide range of frequencies from 28.0 to 29.7 MHz, our largest HF allocation, most amateurs were content to tune 28.0 to 28.1 MHz for the CW action and 28.5 to 28.6 MHz for the voice action. Internationally 29.3 to 29.5 MHz has come under intense use as a result of the amateur satellite service and nationally 28.1 to 28.6 MHz has seen great use with the introduction of the novice licence.

The growing world-wide interest in the frequency range from 29.5 to 29.7 MHz has resulted from the tremendous amount of activity occurring on this band in the United States. Many of us in Australia who operated on 6 and 2 metres in the early 1970s using modified commercial taxi transceivers can remember the keen tinkering, building and exploring spirit of those operating 6 and 2 metres before the days of widespread commercial amateur gear.

This is the situation which has generated so much interest in 10 metres FM. At present I would estimate that 95 per cent of those on 10m FM are using modified VHF gear in the USA. They see their interests and style of operating as different from those using the same mode on 6 and 2 metres. They like 10 metres FM because "it's different to what's going on on 2m", "there's not the nonsense you pick up on 2", "it's got all 2 has got plus more", etc. etc.

THERE ARE OVER 50 REPEATERS NOW OPERATING IN THE 10 METRE BAND BETWEEN 29.5 TO 29.7 MHz.

One of the enjoyable things I have found on 10 metres FM is that just about every day you can meet up with the same person you spoke to the day before. You certainly get to know quite a few operators by talking through the US repeaters, as well as on 29.6 MHz which is the National FM calling and operating frequency. This is certainly a different experience from 10 metres SSB where just about every DX contact is a new one.

THE AMERICAN 10 METRE REPEATER BAND PLAN

Channel Number	Input Frequency (MHz)	Output Frequency
1	29.520	29.620
2	29.540	29.640
3	29.560	29.660
4	29.580	29.680

Most 10 metre repeaters conform to this band plan with 20 kHz channel spacing and 100 kHz separation between input and output.

10 metre repeaters function in the following way: A signal which is received on the input frequency is transmitted via 440 MHz UHF or via a telephone line to the repeater's transmitter site from where that signal is re-transmitted.

This means that a 10 metre operator in the USA can actually listen in to three frequencies and select the one with the best reception. He can listen to the original signal at the 10 metre input, he can listen to the UHF link or to the 10 metre output. To make contact with USA repeater operators from Australia one can either transmit on the repeater's input and listen to or quickly dial up to the repeater's output or one can listen and transmit on the repeater's output.

All the American needs is a UHF transmitter in his car tuned to the 10 metre transmitter's input and a 10 metre receiver.

CONTROLLING A 10 METRE REPEATER

Most repeaters on 10 metres are open access systems which means that any signal appearing on the input is automatically relayed onto the repeater's output. This means that there is no problem in working into these repeaters from Australia.

The common modes for international working are CW and SSB and these are used much lower in the 10 metre band. Up the top end FM is the in mode and operators are aware of the various simplex and repeater channels. Any SSB or CW operator who ventures into the top end soon finds out about these various frequencies when he hears a mass of heterodynes on certain frequencies. (This is what ± 5 kHz of FM deviation sounds like on an SSB receiver.) In Australia we are restricted to ± 3 kHz of FM deviation on 10 metres, which is so narrow that SSB listeners are able to resolve this as an AM station by zero beating.

The disadvantage of only ±3 kHz FM is that the American and European and Japanese FM operators may ask you to turn up your deviation or speak closer to the mike. However, our regulations once explained means they just wind up the audio gain on their receivers.

The advantage of extra NBFM is that we can use this on 28.1 to 28.6 MHz and work crossmode with the novices, thus interesting them in the techniques of FM.

Only a few of the 10m repeaters require tone access, however because of the growing interest of working into Australia and Europe on FM, repeater maintainers often monitor the repeater's input so that when a DX FM station attempts access, the required tone is transmitted permitting acces to the DX FM operator.

American operators can send controlling signals which will automatically shut down a repeater or which will open a direct line with a local police department or which will link up with another VHF repeater on 6 or 2 metres. It is very interesting just how varied repeater usage can be.

A procedure that had me listening in for hours was the use of the Ten code by an extensive network of mobiles which appeared to be on some patrol or exercise. The snappy and highly organised operating procedure was a delight to listen into.

Not all repeaters operating on 10 metres use FM. Some, called linear repeaters, can

transmit AM, FM and CW, others can re-transmit SSB.

Some of the Repeaters which can be worked daily from Australia are:

CHANNEL 1
(29.520 MHz in, 29.620 MHz out)
WR6BDG — Sierra Madre, Calif. Carrier operated access.
WR1AJF — New Fairfield, Conn.
WR1AAA — Malden, Mass. Carrier operated access.

CHANNEL 2
(29.540 MHz in, 29.640 MHz out)
WR6AAK — Los Angeles, Calif. Requires 107.2 Hz access tone.
WD4MRW — Tampa, Florida. Closed private repeater.
WRZANW — Fort Lee, New Jesrey, Autopatch emergency powered. Facilities to cross-band into other repeaters, direct access to Police.
WR2AMI — Dallas, Texas.
WR5AOK — Pt. Neches Groves, Texas.

CHANNEL 3
(29.560 MHz in, 29.660 MHz out)
WR6AFB — San Diego, Calif. Requires 107.3 Hz tone to access.
WR6AWR — Santa Barbara, Calif. AM repeater. Req. 1950 Hz to access.
WR0AQE — Boulder, Colorado. Requires 91.5 Hz tone to access.
WR4ATE — Jacksonville, Florida. Carrier operated access.
WR9AKD — Split-Prospect Ht, Illinois. Carrier operated access.
WR3AID — Towson, Maryland.
WR2ABA — Huntington, New York. Carrier operated access.

CHANNEL 4
(19.580 MHz in, 29.680 MHz out)
WR1ACY — Glastonbury, Conn. Civil amateur radio emergency service. Civil patrol, carrier operated access.
WR3AID — Towson, Maryland. FM carrier accessed.

10 METRE CONTROLLED TRANSMITTERS

As well as repeaters there are dozens of remote controlled transmitters which like the repeaters are owned and operated by either associations or in many cases, by individual amateurs.

Remote controlled transmitters are almost the same as repeaters. They are located on a high location, can cross-band and link with other repeaters, can link into the local telephone system (autopatch) or into the law enforcement agencies.

Remote transmitters operate in this way:

You transmit on, say 440 MHz and the remote transmitter re-transmits you onto 29.6 MHz. Anyone on 29.6 MHz is re-transmitted back to you on your frequency of 440 MHz. From Australia it is quite easy to contact the many local communities who operate such remote transmitters. By transmitting on their 10 metre frequency, an American is able to either receive you from the remote site via 440 MHz or direct on 29.6 MHz and can likewise call you either from his home using 29.6 MHz or via the 440 MHz link which is re-transmitted onto 29.6 MHz. Thus communications can be maintained as selective propagation occurs between these two sites.

One of the most consistent signals into Australia from a remote transmitter is that of WB7CZQ on Stranger Mountain, Washington, which can be switched between two selectable frequencies. 29.6 MHz primary or if in use, the users switch the system onto 29.64 MHz.

GETTING STARTED ON 10 METRE FM

Commercial transceivers covering 70 to 85 MHz or 6 metre modified FM gear can be obtained from between $15 to $35 and modified onto 29.6 MHz.

USA operators using 5 watt modified CB radios have been putting incredible signals on FM. These sets are easy to get onto FM by applying a small part of the audio output to the Varicap diode in the clarifier circuit and disconnecting the audio being applied to the power amplifier stage.

FM reception can be achieved by using an appropriate detector in the 455 kHz IF stage. For receiving wide-band FM the 455 kHz IF can be widened and the filter replaced. Many of the contacts on 10m FM have been with mobile operators using vertical whips.

In Europe there are 15 amateurs in Copenhagen, Denmark, using 29.6 MHz. The operator I spoke to, OZ7IS, only runs 6 watts FM to a ground plane. In Norway it is popular to add the microwave converter MMC28/144 onto a 2 metre transceiver.

This converter, which sells in Australia for $45 will receive 29.6 MHz when your 2 metre receiver is tuned to 145.600 MHz. The idea of hearing world-wide FM on my 800 channel 2 metre FM set is really tickling my mind at the moment. To transmit FM it is quite easy to simply modify an FT200 and FT101B (see previous articles in AR).

The modification of the TS820 is almost identical to that of the FT101B.

Microwave modules in the USA are said to be developing a transverter so that you will be able to transceive on 10m FM using any 2m FM transceiver.

Japanese amateurs as well as the Americans and Europeans, have also been using complete home-made systems as well as USA Army transceivers. Several ex-Military FM sets which cover 29.6 MHz are available in Australia.

Two new commercial 10 watt 80 channel FM transceivers selling for $260 have become available. In Japan a unit called the UNICOM UX502 is in use and in the USA a unit called the COMTRONIX FM80 has also just been released.

Both units use the following 80 channel system. Standardisation to this system will help to make contact with those using these transceivers.

TABLE OF CHANNELS 1A TO 40A FOR 10 METRE FM USERS

Chan A	Freq (MHz)	Chan A	Freq (MHz)
1	28.91	21	29.110
2	28.92	22	29.120
3	28.93	23	29.130
4	28.94	24	29.140
5	28.95	25	29.150
6	28.96	26	29.160
7	28.97	27	29.170
8	28.98	28	29.180
9	28.99	29	19.190
10	29.00	30	29.200
11	29.010	31	29.210
12	29.020	32	29.220
13	29.030	33	29.230
14	29.040	34	29.240
15	29.050	35	29.250
16	29.060	36	29.260
17	29.070	37	29.270
18	29.080	38	29.280
19	29.090	39	29.290
20	29.100	40	29.300

TABLE OF CHANNELS 1B TO 40B

Chan B	Freq (MHz)	Chan B	Freq (MHz)
1	29.310	21	29.510
2	29.320	22	29.520
3	29.330	23	29.530
4	29.340	24	29.540
5	29.350	25	29.550
5	29.360	26	29.560
7	29.370	27	29.570
8	29.380	28	29.580
9	29.390	29	29.590
10	29.400	30	29.500
11	29.410	31	29.610
12	29.420	32	29.620
13	29.430	33	29.630
14	29.440	34	29.640
15	29.450	35	29.650
16	29.460	36	29.660
17	29.470	37	29.670
18	29.480	38	29.680
19	29.490	39	29.690
20	29.500	40	29.700

Note that the range 29.360 to 29.5 MHz is currently used by American and Russian amateur satellites and should be avoided.

Of the commercial amateur sets available the FT901D is the only one which includes FM transceive facilities. The deviation control under the top cover can be adjusted with on-air tests until a total 6 kHz is indicated on the tuning range of an SSB receiver. Adjustment of this potentiometer is quite critical but once attained, you are all set. Existing ground plane and beam antennas can be quite effective up the top end of 10 metres with the use of an antenna matcher. My next experiment will be to work the USA repeaters hand-held pedestrian using the new USA Palomar transceiver which will soon be available in Australia and will include FM facilities. ■

EQUIPMENT REVIEW

COMPARISON TEST, KULROD UHF MOBILE ANTENNA TYPE LM-420

UHF FM mobile is not particularly popular in the Melbourne area and at this point in time with one repeater operating in Melbourne (VK3RAD) and more proposed, it is therefore important to recognise suppliers and their equipment if an excursion to 70 cm FM is to be undertaken.

Don Sinclair VK3VH
Glen Percy VK3PE

Antenna supplied by Toowong Agencies, 15 Kapunda Street, Toowong, Queensland. Telephone 370 8785.

TEST EQUIPMENT
Sierra in-line power meter/reflectometer 144-470 MHz insert.

Texscan Corp. in-line stepped attenuator.

Horwood combination reflectometer (field strength) meter 75-450 MHz.

TEST TRANSCEIVER
Converted Westminster UHF W15.

TEST VEHICLE
1978 Falcon panel van, centre roof mount.

The antenna supplied is quite an attractive unit, being made of best quality stainless steel and gave an overall picture of good workmanship. Unfortunately, nowhere in the accompanying instructions did the supplier state the antenna configuration or gain figures. The antenna, however, follows the popular "Ringo" configuration, being three half waves at the base by a small coil. The centre phasing coil is completely weather sealed and enclosed in strong plastic as is the base coil. The antenna is supplied with its own base and connection instructions.

The antenna is not compatible with most commonly used bases, the centre conductor being too long; they can be used however with a slight increase in VSFR.

With the base supplied, an SWR of 1.2 : 1 was obtained and an SWR of 1.6 : 1 was obtained with a Scalar mount. When used with a Scalar mount, the antenna sits high and there is a gap between the bottom of the antenna and the top of the base. This could be overcome by cutting approximately ½ in. off the standard Scalar base. As "Murphy" dictates, this makes your Scalar mount useless for other antennae; this is the case with most other bases. The problem is caused by insufficient depth in the socket at the base of the Kulrod.

Apart from this major difference, the antenna when mounted is quite rigid and although almost 30 inches long does not flex, and at high speeds remains vertical (test speed of 100 km/h).

Instructions with the antenna states a coverage of 420-450 MHz. For a centre frequency of 435 MHz (being the centre of the repeater band) the bottom portion only is to be cut to 9¾ in., the top portion of 15 in. is not to be touched. The bottom section slides from the bottom coil and is cut and locked in again (Allen key supplied). Overall length for frequency of 435 MHz is 30 in.

TESTING
Gain of the antenna was measured using a stepped attenuator and monitoring the limiter current. While VK3PE keyed his transceiver, a noisy signal was obtained with 5 dB of attenuation in the antenna line. This noisy signal was used so as to avoid saturation of the receiver. The 5 dB of attenuation gave a limiter current of 30 uA. The reference antenna used was a standard ¼ wave and Scalar mount.

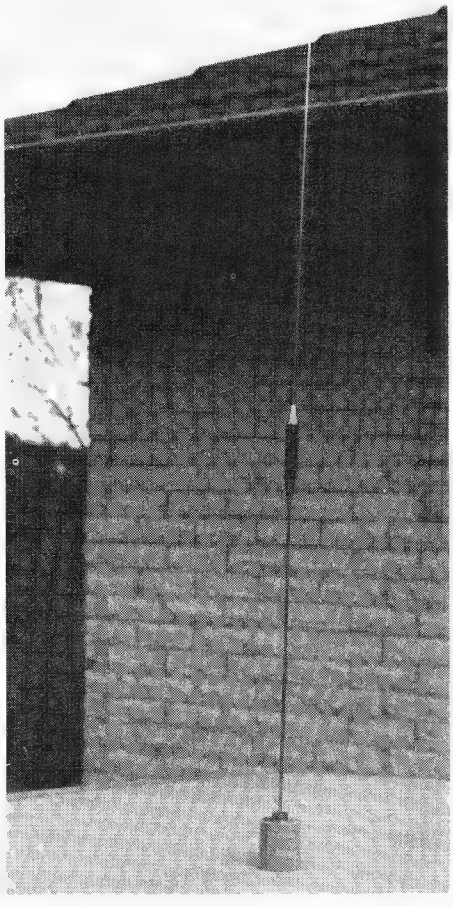
Then the Kulrod antenna and base was substituted and another reading was taken. An extra 3 dB had to be added to bring the limiter reading again to 30 uA. This meant the Kulrod had a gain of 3 dB, which was expected. In both cases 10 ft. of RG58 was used and both antennae had VSWR no greater than 1.2 : 1.

ROAD TEST AND COMPARISON
During a fortnight of use in the author's vehicle, comprehensive testing in low signal areas was undertaken. The Kulrod produced more flutter on receive than the author's usual antenna (Scalar co-linear). At a well known noisy spot on the Ballarat Freeway, the signal both on receive and transmit was down compared to the author's co-linear when working through VK3RAD. This was also the case in other known bad spots.

GENERAL SUMMATION
As a general mobile antenna the Kulrod antenna produces only very fair results, and is not considered a "DX" antenna by any means. The antenna fulfils the requirements of most amateur operators and is definitely superior to a ¼ wave antenna which was the basic antenna used in all the experiments.

No tests were carried out involving "Ski Bar" mounts as this form of mounting, from previous experience, is highly inefficient. Results from any VHF or UHF antenna can only be obtained by good engineering and practice. A good ground plane might be maintained and all soldered connections be neat and tidy. It has become very evident, especially with 5/8ths and co-linears as mobile antennas, that the bigger the ground plane area the better the results.

Sincere thanks are extended to the following call signs — VK3YEO, YOC, AAF, RN, YES, ZKV, EM, YN, AFL, BAF, AHO, AJI for their assistance in obtaining the above details. ■



THE FINAL COURTESY OF A QSO IS A QSL CARD

Cards, cards and more QSL cards. A total of 84,914 QSL cards, an average of over 7,000 per month, passed through the VK3 Outwards QSL Bureau during 1978. There has been an increase in this quantity so far during 1979.

Involved is the preparation of about 100 large and small packets per month, of cards for other QSL Bureaux throughout the world. Not an easy task to ensure an even flow is maintained, the packets are prepared so that as far as possible they arrive safely at their destinations, and postage costs are kept to the minimum.

As Fred Lubach VK4RF, says on page 23 of March 1979 AR, the way some of the cards are filled out cause QSL officers to tear their hair out. Perhaps this is obvious from the cover photo.

Please, oh, please, read Fred's article carefully, and follow the criteria outlined when sending cards through your bureau. In VK3 if you are still not sure, an information sheet is readily available. This sheet also describes the operation of the VK3 Inwards QSL Bureau.

The VK3 Outwards QSL Bureau card sorting racks of the Officer-in-Charge, Roy Prowse VK3XY and part of his radio room, with grandson Darren, an up-and-coming amateur enthusiast.

Your co-operation will make the task of your voluntary QSL Officer so much easier, and allow him more time to work some of the DX stations he sends cards to on your behalf.

From Roy Prowse VK3XY. ■

THE "MUF" IS RISING

By J. F. Hanran VK4JH

The "MUF" is Rising very fast,
'Tis the after effect of a Solar Blast;
It sprays its rays through thick and thin,
While the amateur sits with a sickly grin.
"It won't be long!" he says at last;
Wacko! DX now! Thick and fast.
But the sun grins back and he says for sure,
'Tis only my minor overture;
To 51 I'll go, no more;
To 52 it's an arduous chore.
So the keen boys listen and read the band,
But nought do they hear from a foreign land.
So it came to pass in the "Year of the Yen",
The VKs were working the JAs again;
Once rare JAs came in much too slowly,
In a very short time they became rather lowly;
There were more JAs than a man could work,
"There's better DX!" you'd say with a smirk.
With Channel O gone and 5A at last,
What say we give 50 megs a blast;
No one will hear us that's for sure,
The Amateurs' Principle is much too pure;
" 'Tis Science, and Fact, and Experiment too,"
That's the Amateurs' Code from me down to you.
Now HL and KG were starting to break,
'Twas more than some of the boys could take;
So in sad desperation while scratching their head;
"I'll swear 50 megs will gather the bread."
This was the answer they found at long last,
That contacts on Fifty could come very fast.
Our 28 megs was going full steam,
It's the moulding band for a 50 meg dream;
The chaps up in HL, KG, and CE,
Have from 50 to 54 megs; What a spree!
And the boys down in VK said "OH! What a Pity",
That such rare DX doesn't come to our city.
The Lush Path to Frisco was too long in coming,
Are our predictions the result of an incorrect summing;
If the P and T could be tempted to proffer,
There'd be plenty of fine DX in their offer;
Why worry they said, "It worked once, it's terrific!"
We can use 50 megs to cross the Pacific.
For long the high band remained tightly closed,
You can imagine the problem that this one posed;
"It worked once on Guam, I can't see any reason,
Why it won't work with LU or XE this season."
The predictions were right and they conquered Low Grade,
Contacts with W and XE were made.
As in the days of old when "Pirates Bold" sailed the Spanish Main;
A treasure untold, much greater than gold, came into view again;
The Signal was weak, at first so to speak;
And they listened with sparkling fangs bared;
Then out of the pack, just like a whip crack;
The VP1 was snared.
The feather in the cap or the scoreboard on the wall,
Are all the same Cinderella after the ball;
The Card, The Contact, The Honour, The Glory;
Just put 50 megs it'll tell the whole story.
When the accounting is done and you've worked out your haul,
Remember it's April, and Autumn leaves fall.
You need one to lead, for the others to follow,
What is fashion today is Old Hat tomorrow;
Won't be long now, and the high band will open;
Well! — That's what lots of VKs are hopin';
Then when you work that rare one for certain,
On — "FIFTY-ONE MEGS" — you'll have rung down the curtain. ■

WARC '79

How important are these international general radio conferences of the ITU as they relate to our amateur service? This question has been asked over and over again and has been answered in the pages of AR repeatedly.

Many amateurs clearly understand the importance, the vital importance, of these Conferences as evidenced by all the generous donations from so many to the WARC 79 Fund.

The attitude of "she'll be right" when the time comes is a forlorn hope unless our amateur service efforts are backed to the utmost by all amateurs.

The attitude that the WIA, IARU or some other amateur body will "take care of things for us regardless of whether or not I am a member or supporter" is yet another misconception spawned out of selfishness and perhaps the feeling that the right to criticise any outcome applies equally to those who do and those who do not support the society. "Let them do the work so that we can tear the results to pieces" seems to be a common disease.

Enough of this.

Looking back at the outcome of the last four major ITU general Conferences is interesting insofar as the amateur service is concerned. Out of the Washington Conference in 1927 we got 7.0 to 7.3 MHz and 14.0 to 14.4 MHz as exclusive amateur bands and 1.715-2.0, 3.5-4.0, 28-30 and 56-60 MHz as shared bands.

The 1938 Cairo Conference, for the world other than Europe and the Americas, gave us 7.0-7.2 and 14.0-14.4 MHz as exclusive bands and 1.715-2.0, 3.5-4.0, 7.2-7.3, 28-30 and 56-60 MHz shared. This also applied to Europe except that they lost 3.635 to 3.685 MHz and gained 112-120 MHz as a shared band. The Americas retained all the 1927 bands and gained 112-118 MHz as an exclusive amateur band.

The next conference was the 1947 Atlantic City Conference at which the three ITU world regions came into being. Here in Region 3 we got 7.0-7.1, 14.0-14.35, 21-21.45, 28-29.7, 50-54 and 144-148 MHz as exclusive amateur bands with 1.8-20, 3.5-3.9, 7.1-7-15 and 420-460 MHz shared. Region 1, however, lost the 160m and 6m bands, but Region 2 gained the 220-225 MHz bands as well as 420-450 MHz on a shared basis and 144-148 MHz as an exclusive allocation. The Region 1 allocations were — exclusive 7.0-7.1, 14.0-14.35, 21-21.45, 28-29.7, 144-146 MHz and shared 3.5-3.8, 7.1-7.15 and 420-460 MHz. Region 2 allocations were — exclusive 7.0-7.3, 14.0-14.35, 21-21.45, 28-29.7, 50-54, 144-148, 220-225 MHz and shared 1.8-2.0, 3.5-4.0 and 420-450 MHz.

The next conference was the Geneva Conference of 1959 — WARC 59, at which the late John Moyle VK2JU was an amateur observer with accreditation as a member of the official Australian party. The outcome of this Conference, insofar as Region 3 was concerned, basically summarises the pre-WARC 79 band allocations as being — exclusive bands 7.0-7.1, 14.0-14.35, 21-21.45, 28-29.7, 144-148 MHz, 24-24.05 GHz, shared bands 1.8-2.0, 3.5-3.9, 420-450, 1215-1300, 2300-2450, 3300-3500 (3300-3400 MHz in Region 1), 5650-5850 MHz 5650-5925 MHz in Region 2), 10-10.5 GHz, 24.05-24.25 GHz and a partially shared 50-54 MHz band. Region 1 exclusive bands were 7.0-7.1, 14.0-14.25, 21-21.45, 28-29.7, 144-146 MHz, 24-24.05 GHz, shared 3.5-3.8, 14.25-14.35, 430-440 and SHF shared bands as shown for Region 3. Region 2 exclusive bands were 7.0-7.3, 14.0-14.35, 21-21.45, 28-29.7, 50-54, 144-148, 220-225 MHz, 24.0-24.05 GHz shared bands were 1.8-2.0, 3.5-4.0, 420-450 MHz and upwards as shown for Region 3. One of the higher frequency bands derived from the 1971 Space Conference.

All the above derived from tabulations prepared by IARU Region 1, but do not necessarily apply to every country. For example the 420-460 MHz shared Region 3 allocation at the Atlantic City Conference was never applied in Australia until radiolocation came into being at WARC 59 and we were allocated 420-450 MHz on a shared basis some years later.

The late John Moyle "carried out his assignment on behalf of the Australian Amateur in a manner which can only leave us all feeling peculiarly humble. Even when he returned and underwent a most serious operation, his tenacity of purpose and never-ending interest in Amateur Radio drove him, under extremely uncomfortable circumstances, to write his final report to you . . . the Amateurs of Australia". This quotation is from the editorial of AR of March 1960 in which John Moyle's report was published.

Anyone wishing to know how these ITU conferences affect us should carefully study this report in AR for March 1960 and note that WARC 79 will undoubtedly be even tougher.

For those who cannot refer to this issue of AR check out some of these quotes from John Moyle's report.

"Its (WARC 59) pages of tables and regulations will clearly reveal how much work went into their preparation, but can tell nothing of the drama, the dangers, the tension and the hours of frustration and achievement through which we lived during the long weeks (Aug.-Nov.) of the Conference."

"I only wish every Amateur could have been present at least part of the time. He would have learned about the enormous pressures on frequency space which have literally made portions of the spectrum unworkable; he would have seen how Amateur problems, important though they are to use, are only a small part of the incredibly complicated pattern of modern communication."

"A final result obtained appreciably better than most of us hoped for."

". . . the Amateurs received an excellent hearing at every level of the Conference and a very fair hearing at that."

"But there is a rider that broadcast stations must vacate the exclusive Amateur portion between 7 and 7.1 Mc. Frankly this isn't worth much, because several countries now poaching there announced quite openly that they won't move until given clear channels, of which there are none." ". . . the standard and bitterness of the debates on this matter, the special committees set up to handle it, and the good old duck-shoving that went on, convinced me that high political bands were at work, far beyond any capabilities of mine to influence."

"These conferences are meetings of national delegates, each of which has a vote (only 96 countries in 1959). It follows, therefore, that the first aim is to convince each delegation that the claims of the Amateurs are as strong as those for any other service and thus to secure votes for them. It is far too late to initiate action at the conference itself, by which time most decisions have been made up to this level."

"We fell down because our preliminary work over the years was not good enough, and we were obliged to take drastic action at a late hour." (Lesson well taken years ago for WARC 79.)

"Coming straight from Geneva, where our very future was being battled for, I was astounded and discouraged to find that Divisions had voted against holding a Convention this year (1960)." (An Extraordinary Convention was held eventually.) "All our excellent, and often elaborate, Divisional set-ups will be of little use if we haven't the bands to use them."

"I believe that every Amateur who tacks his licence to the wall must shoulder an inescapable responsibility to his fellow Amateurs and to the Amateurs of the future. If he fails them, they must suffer and may even cease to be." ■

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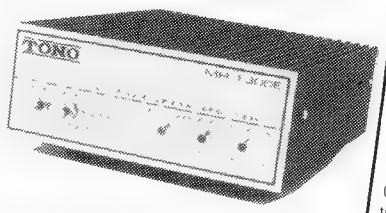

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Resolution	
Frequency	1Hz
High frequency	10Hz
Period	0.1μs
Time	1μs
Display	8 digit LED, leading edge blanking
Sensitivity	
Normal input	20mV
High frequency input	20mV
Time inputs	0V to +3V level shift
Input impedance	
Normal input	1Meg // 15pF
High frequency input	≈75 ohms
Time input	>10k
Maximum input voltages	
Normal input	70V ac,+ 100V dc
High frequency input	200mV ac,∓ 50V dc
Timing inputs	+100V dc
Crystal frequency	
nominal	4000kHz
actual	3999.995kHz
Stability and accuracy	
Frequency	Depends on crystal used and initial adjustment. Oven used keeps temperature within 2°C.
Period and time	approx –0.000125%

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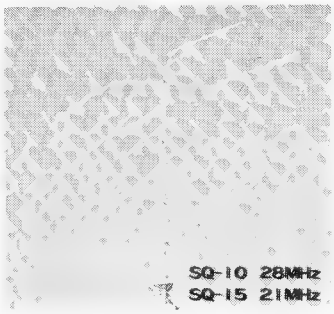

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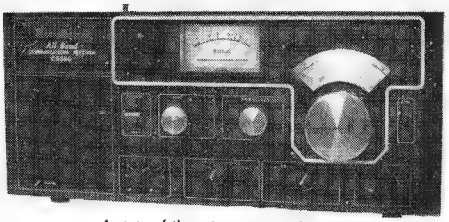

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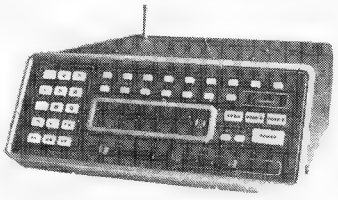

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June 10th, 1979.

The radio conversation was in no way unusual. "VK6ZAT, this is VK6DN," I said. "How are you today, Bruce? The temperature is going up to 40°C. Sure glad my room is air-conditioned." What was unusual was that I had just broken my neck at the cervical five, six and seven level three days before. Lying in the Intensive Care Unit of the Royal Perth Rehabilitation Hospital, my body paralysed from the shoulders down. Only my arms could move and those only weakly upwards.

The effects were devastating on a person who had been leading an active life of hiking, bicycling, scuba diving and flying. As a Canadian from Toronto who had arrived in Perth in 1977 to teach High School, I enjoyed the sunfilled "Sandgroper" life, and extended my stay from one to three years. In December, 1978, a lift in a car from Perth to Adelaide proved tragic. The monotony of the Nullarbor Plains early in the morning caused the driver to doze at the wheel and the car rolled over. Asleep at the time, I regained consciousness to find myself still firmly strapped in the passenger's seat, but unable to move a single limb. Transferred to Kalgoorlie by ambulance, and flown to Perth by the Flying Doctor Service, my X-rays brought the bad news that my spinal cord was severed and I would be confined to a wheelchair for life.

During registration, I was assigned to Sir George Bedbrook, a pioneer and world renowned authority in the field of spinal injuries. During our first meeting, the topic of amateur radio was discussed and Sir George described his friendship with Jim Rundle (VK6RU), a local amateur. Jim had enabled Sir George to communicate on the air with a South African amateur, who was the director of a large and progressive spinal unit. A call by Sir George to Jim led to the erection of a two metre antenna outside the Intensive Care Unit.

Once the antenna was erected, a nurse was able to hold my portable walkie-talkie and operate the OFF-ON switch. Within a short time I was in touch with my amateur friends. My first contact was with Bruce Jacobs VK6ZAT, an active amateur who is also confined to a wheelchair, due to loss of his legs. After a few contacts with Bruce, it became most apparent that modifications to the system were required, as I could not continue to impose on the busy nurses for any extended time. Discussions between Bruce and another amateur, Bob Wynn VK6WY, a paraplegic who lectures in electronics at a technical college, led to a proposed solution. Bob, with a number of other interested amateurs, built an automatic scanner, which allowed my receiver to lock on in sequence for three seconds each of the ten most actively used frequencies in the Perth area. If any channel was in use, the scanner locked on that channel. If I cared to talk on that channel, all I had to do was drop my arm momentarily on to a sensitive air bulb switch and turn on my transmitter. Hitting the switch again would turn off the transmitter and allow reception of my friends' conversation. The pressure required to operate the bulb was only a few grams, and I had to raise my arm only a few centimetres to clear the bulb, which was the limit of my ability at that time. Due to my weakness, it was possible for me to leave my transmitter on, which would lock the repeater "On", preventing other amateurs from using it. Bob later installed a timing circuit, which cut off my transmitter at the end of three minutes, putting the set back into receive condition. This allowed other amateurs to use the system again.

During operation, the microphone was mounted on a swinging boom fitting into a mount, one of which was fixed to the head posts on each side of the bed. Thus I could talk, whether I was lying on my back or on either of my sides. Since I was turned from one position to another every two hours by the hospital staff, this feature was most important.

During the next six to eight weeks, rigidly confined to bed in spinal traction, amateur radio played an important rehabilitation role. Firstly, talking and listening to my friends on the radio provided a pleasant alternative to watching television at a time when it was impossible for me to read. Secondly, communication with my amateur friends was tremendously supportive, especially when I saw what Bruce and Bob could do, and how they could live a normal, married and productive life, even on wheels. Thirdly, as my condition became known on the air, I was visited by many Perth amateurs. This both cheered me up and encouraged me to persevere in my recovery. Finally, the radio provided me with a link with normal life as it had been before the accident.

In the hospital setting following an accident, quadriplegics at first are unhappy and often depressed, not only because they are secured to their beds by steel calipers embedded in their skulls, but also because they are unable to do so little as roll over, or even to scratch their heads. The psychological need for the continuation of old interests and activities is acute. The ability to carry out easily and successfully an interesting activity such as operating a radio, calling up friends and talking to people of similar interests was, for me, a good way to avoid the depression suffered in the early days by many spinal patients. Yet, much as I enjoyed the contact with the outside world, I regretted my inability at that time to communicate with the other patients. I felt that the availability of suitably modified CB radios, for rent, would permit bed-ridden patients within the hospital to share their experiences and offer mutual support. It could be that the introduction of CB radios for non-amateurs could be an important rehabilitative agent, possibly even superior to rental television, as the patient is actually participating in, and accomplishing, an activity.

After five months in the hospital, I still use the two metre set, though not as frequently as during the early days. Application has been made to establish within the hospital my high frequency radio transmitter. With the establishment of this station, it may be possible to interest other patients in a hobby ideally suited to

those on wheels. Communication by radio with the handicapped of other countries may increase understanding of the nature of the disability, and techniques being used elsewhere to deal with it. Certainly, the hobby has aided my rehabilitation and has given me objectives to work for in the near future, which may be of further assistance.

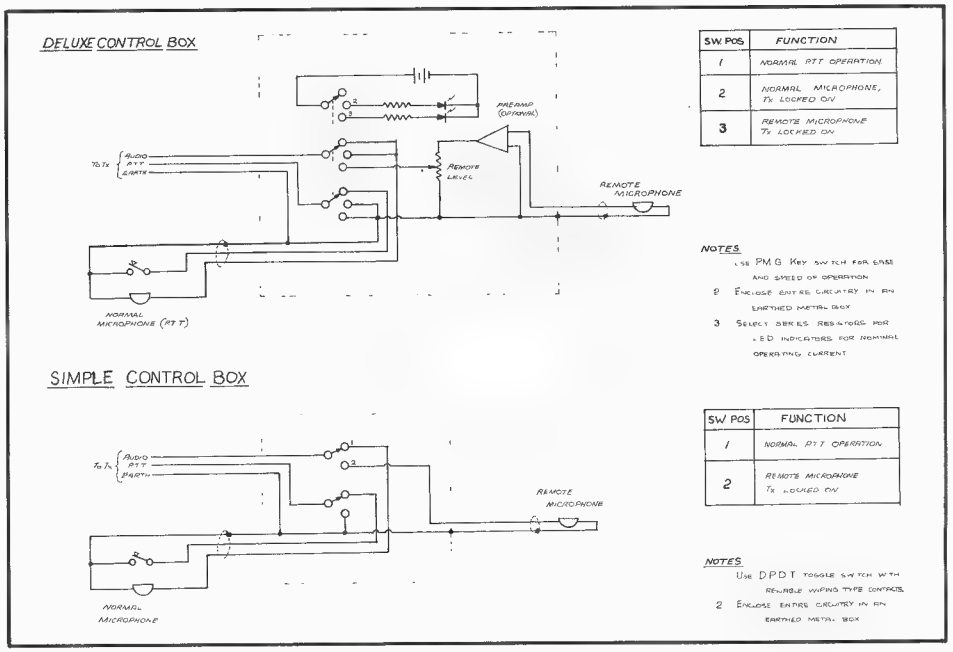
Support in permitting the construction of my radio hobby has been appreciated. The initiative taken by Sir George Bedbrook is symptomatic of the progressive techniques being used by the Royal Perth Rehabilitation Hospital. It is hoped that the use of radio within hospitals will spread. Happier and more quickly rehabilitated patients provide ample justifictaion.

EDITOR'S NOTE

The article, "Circuit Modifications to a Kyokuto Transceiver for Handicapped Operation", by Robert Wynn VK6WY, as referred to earlier will be published in a future edition of AR. ■

GETTING INTO JAMBOREE ON THE AIR

The 1979 Jamboree on the Air will be held from 0000 hr. on the 20th of October to 2400 hr. on the 21st of October GMT. Amateurs all over the world will be assisting Scouts to make contact with each other during this week-end. This article is designed to help previously participating JOTA operators to better prepare themselves, and introduce new participants to some of the "tricks of the trade".



The first thing to do is to contact your State Commissioner for Radio Activities, who will be able to point you at a suitable Scout group. Don't be put off by this impressive title, he is probably an ordinary amateur prepared to do the organising. You will find this man has a team of Area Co-ordinators, one of which you will probably be dealing with direct.

Work out the conditions you are prepared to operate under, for example, the bands you will operate on, the period of operation, and how many Scouts you think you can handle at any one time. In making these decisions, consideration should be given to the expected propagation factors, the terms of your licence and your equipment capabilities.

Ideally you should keep the JOTA week-end free of other commitments as this will allow you to extend your operations if you so desire. When you have a firm idea of what you can and can't do, approach the Scoutmaster with your plans. After talking things over with him, a visit to a Scout meeting is in order, there you can talk to the Scouts about Amateur Radio and your plans for JOTA.

Quite a few Scouts will have had some experience of JOTA, but you must make your talk simple and non-technical. This talk will be quite important as it will allow you to gauge the enthusiasm of the troop and pick out those keen ones who will become your invaluable helpers on the weekend. Important concepts that should be stressed include the difference between Amateur Radio and the CB service, on-air manners and rules, "one-way at a time" communication and how to use a microphone. Follow the talk with microphone practise as this will help to reduce mike fright which will be your largest problem. Further preparation can be done by the Scoutmaster, helping the Scouts to decide what they will say to other Scouts around the world.

Do not forget that most groups will also have Cub packs, Brownies and Girl Guides, Venturers and Rangers; all of these groups can become involved in JOTA. A responsible Ranger or Venturer is a great help with such things as QSLing and supervision of the setting up of the station.

We strongly suggest that you work your station portable from the Scout hall or camp if at all possible. This will save you (and your YF) the worries of having a lot of strangers landing on your doorstep and tramping in and out of your home all weekend. Besides, most amateur shacks are not large enough (or tidy enough) to accommodate this style of operation.

As you are going portable we recommend the use of wire antennas, i.e. dipoles, long wires, or a true G5RV with open feed wire all the way to the ATU. With wire antennas, especially those that are end fed, an excellent earth is essential. The performance of your transceiver depends on a good SWR and so this should be continuously metered.

To keep the hoards of eager Scouts clear of your shoulders a microphone on a long cord is preferable to the standard PTT mike on spiral flex. An even better idea is a microphone change-over box that allows you to switch to a roving remote mike. The device also gives you greater control over what is put to air, as you are able to cut in at any time during transmission. Two circuits are shown below for this style of device, the first being very simple and the other including a pre-amp for those with tiny voices.

Now you have made it to the point of choosing the operating room. Rather than using the main hall, go for a warm but well ventilated space about 15 feet by 12 feet with a large bench of comfortable height, near a window (for poking antenna wires out of). Put you back to the masses and be sure you have a comfortable chair, it could be a long sit. Don't have too many other chairs in the room, perhaps five besides those for your "front line" assistants. Use a rough log sheet and have a large stock of pencils and scrap paper on hand for Scouts to jot down call signs, names and addresses.

The following suggestions have been found useful, but not essential, in the past. Clearly display your call sign and name above your equipment. Also display appro-

priate phonetics and some details of your equipment. Another wall can be covered with a map of the world, using coloured pins to mark where stations have been contacted and a larger marker for the location of the station you are currently in QSO with. There will be no lack of volunteers to take care of this project. Large prompt cards suggesting things to say on the air, i.e. name, age, Scout group, rank, hobbies and Scout activities, will help to combat mike fright; while posters showing Q codes, country prefixes or a display of QSL cards can all help to keep enthusiasm high and encourages interest in Amateur Radio. We discovered early that a DX call book will keep some Scouts amused for hours looking up the address of any call they hear on the air. Pamphlets on Amateur Radio and local radio clubs are very useful, the amateur ranks have been substantially increased by those who have enjoyed JOTA.

OK, so you're all set up in your perfect station; your next question is probably "How does operating JOTA differ from normal operating?". Start by calling CQ Jamboree, hopefully you will be answered by another Scout station. The bands are definitely more active during this weekend so it won't be long before someone will answer you. Be sure to tune the station well; the Scouts will not be as used to listening to SSB as you are. On the same point, go for a strong stable signal by preference. Keep a contact going for as long as it takes for all the interested participants to find out everything they want to. JOTA is not a contest or a frenzied search for exotic DX. The Scouts want to talk to other Scouts and hopefully we can provide a means for them to do so. DX is an added advantage but if it is hard to copy or it takes hours to find, the onlookers will get bored.

Many non-JOTA stations will be quite interested to talk to the Scouts. Technical topics should be avoided. Try to obtain an idea of the other station's location and anything that may be interesting or unique about his or her area. Remember to keep Scouts involved in the contact. Nothing is more embarrassing than a JOTA station with no Scouts to talk on the air, so always keep about five willing people around the mike, put a lock on the door if necessary!

On the technical side of things, two controls, the mike gain and the clarifier, will become rather useful. Young voices sometimes don't develop much drive so one eye on the ALC meter and one hand on the mike gain control will become the order of the day. Alternatively, the amplifier control on the second version of the mike change-over box will serve quite well. Once young voices get to the other station, the operator there may try to resolve them as an OM, i.e. he will shift frequency. Don't go chasing him up and down the band as he will only shift again. Just use the clarifier, but don't forget to remove it before shifting to another frequency.

QSL cards are an important part of JOTA for the Scouts. Try to get a direct QSL address for each contact plus the name of any Scout group present. Conversely, request two QSL cards unless you don't want one for yourself. The QSL cards can be designed by the Scout group if they wish, as long as you provide them with the necessary basic information. If the cost of a small batch is prohibitive suggest a rubber stamp to over-print your own cards. The dispatch of direct QSL cards can be handled by a responsible Venturer (or similar), with your handling those to go via the bureau. Remember the limitations on the number of words in the remarks section. Cards will continue to trickle in via the bureau well after JOTA. Don't forget to send these on to the Scout troop, as these will help to keep interest in JOTA alive.

Quite a few ideas have been put together here and a workable division of responsibilities should be devised. We suggest that you get the Scoutmaster or Group Leader to handle information from the Scout Radio Branch, provide the QSL cards, organise *all* camping and catering arrangements and rosters of attendance. You are the visiting amateur, the expert if you like, so don't get bogged down with Scout Association policy or organisation.

The immediate aftermath of your JOTA depends a lot on how long your operate for. If you're only on air for a couple of hours on the Saturday, you'll probably have a room full of Scouts begging you to come back the next day. If your operations go way over the eight hour mark, you will bundle up the coffee stained log sheets, get the boys and girls to dismantle the antennas, bid farewell to the Scout hall and head for the comfort of a hot bath. Either way during the following few days you will no doubt do three things.

(1) You will realise that it was all a lot of fun.

(2) You will decide whether or not you'll be in it next year.

(3) You will make your report to the State Commissioner for Radio Activities.

This final point is very important, and it must be done properly as the State Commissioners will have to have their reports into Canberra by mid-November.

Possible JOTA withdrawal symptoms may include keen Scouts appearing at your door asking to watch you operate, bands of eager log-keepers for the next RD, a Scoutmaster waving P. and T. forms while he talks you into being trustee for the Group's new call sign, or as a final blow, your own youth radio club.

However it all turns out, we hope you will enjoy this year's JOTA as much as we have enjoyed the last six!

CU in JOTA, Greg Brown VK5ZVK, Vicki Brown, operators for the Black Forest Scout Group Youth Radio Club VK5KR. ■

AMATEUR SATELLITES

Bob Arnold VK3ZBB

OSCAR FOR BEGINNERS

Thanks to ARRL I now have a few copies of the revised edition of "OSCAR for Beginners". This leaflet describes the operation of OSCARS 7 and 8. If you would like a copy, please send a 20c stamp to me, QTHR.

SATELLITE NET

From Peter VK4PJ comes the news that a satellite net is now operating on 3630 kHz at 200 EAST each Sunday. Callers will be welcome. Participants already include Charlie VK3ACR and Alan VK2RX.

MODE J AWARD

I realise I have not passed on information published in AMSAT Newsletter and QST on the recently announced Mode J Award. (If you want to keep up-to-date, join AMSAT.) To become a member of "Mode J Club", first complete eight OSCAR 8 Mode J contacts. QSL cards are not required. Just list the call sign of each station worked, along with the date, orbit number and station equipment used. Send this information along with $3 in US funds (a one-time charge to cover cost of the certificate and newsletter) to Mode J Club, c/o Larry Roberts W9MXC, AMSAT Area Co-ordinator, 3300 Fernwood, Alton Il. 62002, USA. A large four colour certificate, serially numbered, will be sent in reply.

If you include a supply of SASE the newsletter will be forwarded, but I guess this requirement will be difficult for non-US residents.

Mode J Club members should be exchanged with your contacts on this Mode and when you collect 50,100,250, etc., contacts, you can apply for endorsement stickers.

Unfortunately, endorsements seem a long way off for VK enthusiasts; we have recorded about 15 stations on Mode J in the past eighteen months. By the way, where are the ZLs — only Ray ZL1BDU is active at the present time.

Remember, if you have a SSB transmitter working on 145.9 MHz all you need is a suitable converter to receive LSB on 435 MHz. The Microwave Modules range (435/28 or 435/144) available from advertisers in "AR" are ideal. It's not very hard!

OSCAR 8

From "HR Report" comes confirmation of a problem experienced with OSCAR 8 on 11th June. On this day it was found that, through low battery voltage, the telemetry was sending meaningless data. The satellite was immediately put into the recharge

HELP
WITH INTRUDER WATCHING

mode for a couple of days to bring the bateries back to normal. Telemetry indicates there is no permanent damage.

Users of OSCAR 8 are asked to observe telemetry channel 3A and to report any situation below 61 counts. If this observation is made please inform Dave Hull VK3ZDH QTHR.

OSCAR PHASE III

Progress towards the March 1980 launch is reported.

- Seven Solar substrates have been forwarded to AMSAT Deutschland.
- Antenna tests of the 435 MHz uplink antenna are looking good. The crossed Yagi design appears to be satisfactory.
- A second Phase III flight structure has been delivered — this is still unassigned to a launch.
- Tests are being run on the IHU (Integrated Housekeeping Unit) computer to be used in the Phase IIIA spacecraft. This unit has been constructed by W2FPY and W1HDX.
- The Phase IIIA flight transponder is under construction in Germany by DJ5KQ. Input range is 435.14-435.29 MHz, output 145.8-145.99.

OSCAR 7

Maury VK8OB tells me he is active on OSCAR 7, Modes A and B. He suggests that AO7 does not turn on until it is in sunlight, which indicates that the batteries are dead and that the satellite's power comes direct from the solar cells. This is a new theory and could well be correct. The only problem is that due to this erratic situation the transponder in use is unpredictable and it is necessary to search both receiving Modes. From this information it would seem that AO7 is operable on morning passes only at the present time.

PREDICTIONS

	OSCAR 7			OSCAR 8		
Date	Orb. No.	Eqx Z	Eqx °W	Orb. No.	Eqx Z	Eqx °W
1	21928	0053	78	7593	0038	58
2	21941	0148	92	7607	0043	59
3	21953	0047	77	7621	0048	60
4	21966	0141	90	7635	0053	61
5	21978	0041	75	7649	0058	63
6	21991	0135	89	7663	0104	64
7	22003	0034	73	7677	0109	65
8	22016	0130	87	7691	0113	67
9	22028	0028	72	7705	0119	68
10	22041	0112	86	7719	0123	69
11	22053	0022	70	7733	0128	70
12	22066	0116	84	7747	0133	72
13	22078	0015	69	7761	0138	73
14	22091	0109	83	7774	0001	49
15	22103	0009	67	7788	0005	50
16	22116	0103	81	7802	0010	51
17	22128	0002	66	7816	0015	53
18	22141	0057	80	7830	0020	54
19	22154	0151	93	7844	0025	55
20	22166	0050	78	7858	0029	57
21	22179	0144	92	7872	0035	58
22	22191	0044	76	7886	0040	59
23	22204	0138	90	7900	0045	60
24	22216	0037	75	7914	0050	62
25	22229	0132	88	7928	0055	63
26	22241	0031	73	7942	0100	64
27	22254	0125	87	7956	0105	66
28	22266	0025	72	7970	0110	67
29	22279	0119	85	7984	0115	68
30	22291	0018	70	7998	0120	70

RS1 AND RS2

News recently received indicates that RS2 is now out of service.

RS1 will not be used again for communication but will be switched on for short periods to enable telemetry signals to be received during the satellite's pass over the USSR. This indicates that we shall not hear it again in the southern hemisphere.

ACKNOWLEDGEMENTS

ARRL, HR Report, VK4PJ, AMSAT, VK3ACR, VK8OB.

PREDICTIONS

The predictions for OSCAR 7 should be reliable. Those given for OSCAR 8 may be a minute or so late as I do not have an accurate orbit time to project the predictions two months ahead. Observation will enable you to apply an appropriate correction. ■

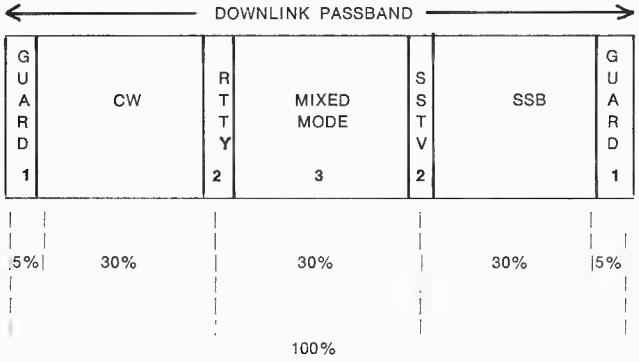
THE SATELLITE USERS' BAND PLAN

As indicated previously, AMSAT have the Satellite Users' Band Plan to which operators are requested to adhere. Some stations in South-East Asia say they have heard Australian stations working through the satellites on frequencies which do not conform to the above plan. Therefore, if you wish to work this DX it is advisable to conform. However, when considering the level of activity from within Australia and New Zealand and the difficulties in working statinos to the North via OSCAR 8 (at least from Melbourne), it is probably of little importance. The information taken from the AMSAT Newsletter is repeated for your guidance:—

THE AMSAT SATELLITE USERS' PLAN

This band plan allocates a percentage of the available radio frequency spectrum as seen on the downlink to different modes of communication. The relative amount of spectrum for each mode is thus the same for any transponder in any satellite.

The allocations are as follows:



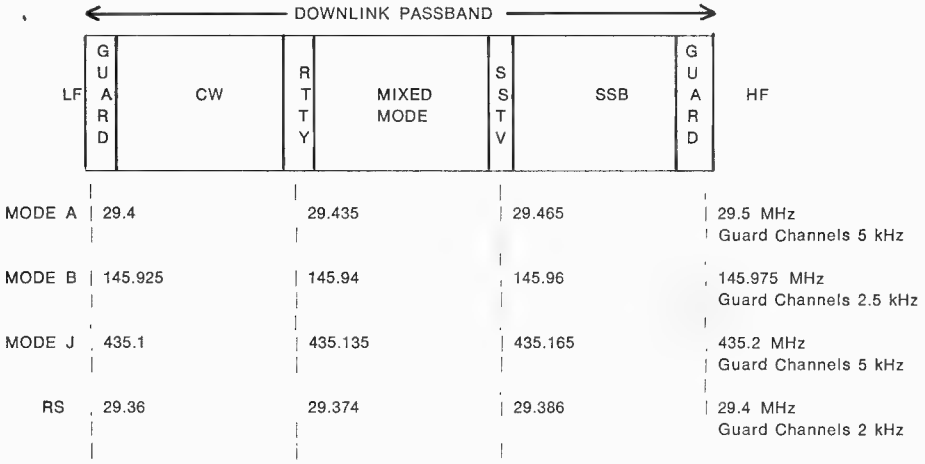
NOTES:

1 Guard Area to avoid interference to beacons. These frequencies are available for Emergency and Bulletin Stations.

2 RTTY and SSTV are placed at the edge of the CW and SSB passbands, conforming to their usage at HF where RTTY is present within the CW space and SSTV is transmitted in the SSB sub-band.

3 Mixed Mode Area. This is recommended for crystal controlled stations, or by Dx-pedition stations, or anyone wishing to work both CW and SSB stations.

This band plan is always based on percentages of the downlink passband. It applies to both inverting and non-inverting transponders. The allocations of frequency for AMSAT-OSCARS 7 and 8 are as follows:



NOVICE NOTES

BREAKING

If you saw two strangers engaged in earnest and obviously personal conversation, it stands to reason that you would not butt in unless you had some matter of importance to discuss.

On the other hand, if the same two strangers were lounging about just making casual conversation, then it is probable that they would welcome your company and invite you to join in.

This rule applies generally to breaking into a group and commonsense is the only guide. If you have something to offer in the way of conversation, or desire information on some subject, then wait for a suitable opportunity and drop in your call clearly and quickly, ONCE.

You may be acknowledged briefly or you may not, but in any case wait until a reasonable time has elapsed before trying again. If you have no success, then either the group cannot hear you and with overseas stations this is quite possible, or they do not want any other stations in the net. In either case it is pointless to persist.

Remember, IF YOU HAVE NOTHING TO CONTRIBUTE, why bother to break in in the first place.

☆ ★ ☆

HAM TERMS

Handle . . . QTH . . . Break . . . XYL . . . QRZ . . . and QSY are all well known and have been used on the bands for years.

Fine business is a common expression of agreement, however it can be overdone.

Terms such as Negatory . . . Breaker Breaker . . . Ten Four . . . Ten Nine . . . Good Buddy . . . Come On, etc., are strictly CB terms and are never used in Amateur Radio.

Remember, too, that you are not "THE" VK3NNR. You might have been THE Rubber Duck as that is your personal call. On the ham bands VK3NNR is the call of your station and is used as such.

OLD MAN, or OM, is an expression of endearment where an operator does not know another's name. The term has been in use since the early days of radio and is not confined only to Ham Radio. Early wireless operators on ships used it long before phone operation was possible and morse was the main method of transmission.

PILE-UPS

If there is a rare DX station being worked by a local operator it is pretty certain that there will be many other hams waiting on the side for the opportunity to call him.

Assuming that the DX station is holding the frequency he will eventually sign and call "QRZ".

Resist the temptation to call him before you are sure that he is clear with the station that he is working. You might not be able to hear the local operator and an attempt to call will cause QRM and possibly antagonise the DX station.

Dropping your call in just before he signs is sometimes permissible, but is frowned upon. The only exception is when the DX station is a personal friend and you feel that he would like to speak to you, or if you have some information for him.

If you know him, then he will recognise your call and possibly bring you on when he signs with the station he is working, but do not call in this manner more than once. If he does not reply, then it is pointless calling further as he probably cannot hear you over the station that he is working at the time.

The methods of cutting through a pile-up are many, but some are not strictly legal. The following may help. Immediately the DX station calls QRZ, follow up with your complete call clearly and distinctly.

Example: "VICTOR . . . KILO . . . THREE . . . NOVEMBER . . . NOVEMBER . . . ROMEO . . . STANDING BY."

He may remember the "November November Romeo" part having picked that out of the general confusion and call you with "The November November station, please QRZ" . . . this is when you return to him as quickly as possible with your call two or three times. Speak carefully and distinctly as his English may not be good.

However, put your call over and then listen. If others are still calling, wait for a moment for a slight lull then "VICTOR . . . KILO . . . THREE . . . NOVEMBER . . . NOVEMBER . . . ROMEO . . . STANDING BY".

Finally, if he still has not called anyone, drop your call in right at the end just as the pile-up is starting to die down. DX operators sometimes wait for the last station in the pile-up to call.

The main rule to remember is not to make the pile-up worse by calling repeatedly without stopping to listen.

Firstly he may have already called you . . . and if he has called somebody else you are only creating QRM. Wait and try again later.

If he seems to be calling another State repeatedly, then it is probable that the signals from that State are getting to him with greater strength than those in your State. Your chances of a contact are thus lessened. If he is working your friend locally, then it is possible for you to choose a suitable opportunity to let your friend know you are on the side. He may then ask the DX station to listen for your call.

This procedure should be handled with discretion, however, and is not wise in very large pile-ups where many stations are waiting for contact. Rather, this is more acceptable where your friend called CQ and thus holds the frequency, or where there are relatively few stations.

Do not ramble on about trivial matters to a rare DX station. He is not particularly interested in your weather, your equipment . . . unless it is something very unusual . . . or how glad you are to work him . . . he knows that already.

The fifteen and ten metre bands are generally DX bands and if a rare station is on the frequency, exchange the minimum of information and give someone else a go.

He will require your name, QTH and, most important, his signal report. You may ask him how he wishes to QSL, and if you may QSL direct should you wish to do so. You may also ask if he is OK in the latest call book. Thank him briefly for the contact, wish him 73s and go CLEAR and QSY.

If you wish to talk at length to him, there is nothing to stop you sending a letter with your card and arranging a sked for a later date. It is important to remember that with any DX station, rare or otherwise, you should move off his frequency after signing with him. If other stations are calling you may say "VK3NNR is off and clear and will listen 5 kHz down . . . or up . . . for any other station".

In other words, if you answer a CQ, it is his frequency unless he offers you the use of it because he is going QRT.

Always establish who holds the frequency before you rush in to work stations in pile-ups.

If you called CQ . . . then of course the frequency is yours, and when signing you should call "VK3NNR is now clear and QRZ any other station".

Finally, when calling a DX station, don't waste time giving out his call as he already knows it . . . you can do that if and when he calls on you to transmit.

From CQDX Radio Group Handbook — by Trevor Reid VK3NNR. ■

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CQDX RADIO GROUP

The CQDX group members may usually be found in QSO on 28.555 MHz at around 2030 GMT (8.30 EST).

The senior club members usually choose a Friday night and the younger members prefer Sunday nights.

The idea is to promote a "rag-chew" session for those who are not primarily DX chasers and for times of low band activity. For anyone who is tuning around, looking for someone to yarn with . . . the members of our group will welcome a call. ■

QSP

NEW CLUBS

Quickening interest in radio communications means more clubs for amateur radio enthusiasts springing up almost everywhere. Latest in the listings is the Southern Peninsular ARC in the Mornington Peninsular area of Victoria. The inaugural meeting was on 4th June and the Secretary is Bob Whitehead VK3NHA, QTHR in the 1979 Call Book (to be released later this month). ■

CADMIUM PLATING CAN BE DANGEROUS TO YOU AND YOUR RIG

The following article appeared in **Radio Communication** June 1979. Cadmium compounds can be very poisonous if swallowed and most of us would not try tasting any that we found laying around. Yet wouldn't you blow off any dust or white powder you found on your rig? Before you do that again please read the article below. We would like the pleasure of your company a little longer.

THE HAZARD OF CORRODED CADMIUM

A recent Tomorrow's World television programme and many other reports in the media have drawn attention to the potential risks of cadmium poisoning, for example in the vicinity of zinc smelting plants. Much less well known is the health hazard arising from the possibility of inhaling or ingesting the "woolly" white powder (cadmium salts of organic acids) which sometimes appears as a deposit on cadmium-plated metalwork (screw heads, switches, etc.) in electronic equipment. It is therefore advisable to take reasonable precautions to remove any such deposits which are due to corrosion and which tend to occur in equipment that is inadequately ventilated so that heat generated in the unit may cause fatty acids, as found in transformer impregnation and sometimes in the coatings of printed circuit boards, to migrate to any cadmium-plated metalwork.

Cadmium corrosion can be removed provided that the following safety procedure is followed carefully:

Never attempt to blow away the white powder, for instance by using an air jet. Use disposable plastic gloves and open and deal with the equipment in a well-ventilated area. Then, using a swab damped with water, wipe away all corrosion products in the affected area, changing the swab after each wipe in order to prevent any spreading of the powder. Afterwards the used swabs and gloves should be placed in a plastic bag and burnt in an incinerator. Make sure the treated surfaces are clean and dry, and then apply varnish to the area.

Now that's not the end of the bad news. If you keep any equipment in chipboard cupboards, paint the cupboards inside as well as outside. Acidic fumes are released by the binding material or glue in the chipboard and these just love to gobble up cadmium and produce white powdery deposits. Painting the chipboard seals these fumes in. Good ventilation may be another way of preventing the problem. Six months in a new unpainted chipboard cupboard can ruin much of the plated parts of a set. ■

AROUND THE NOVICE SHACKS

Hans VK3NOZ, now VK3BSK, a very well known former Novice, in his shack.

Many Novices will have worked JA2FDX (Fantastic DX). I'm sure they would like to see his photo.

☆ ★ ☆

FEEL FRUSTRATED WHEN TRYING TO LOCATE A FAULT? —

Perhaps this might be the answer, it will certainly cure the fault — for ever!!

(Cartoon courtesy of the Artist, Brendan Akhurst and CB Australia magazine.)

MML 50/25
25 WATT 50MHz LINEAR POWER AMPLIFIER & LOW DISTRIBUTION PREAMP

MML 144/25
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* SSB/FM, AM and CW.

MML144/25 SPECIFICATION MML 50/25

LINEAR AMPLIFIER
Power profile: 25 watts typical output for 3 watts input
Frequency bandwidth: 144-148 MHz at — 1dB
Power requirement: 13.8 volts at 2.8 amps for 25 watts output
Quiescent current : 75mA nominal at 13.8 volts

RECEIVE PREAMP
Overall gain: 10dB typical
Overall noise figure: Better than 2.5 dB
Frequency bandwidth: 144-148 MHz at — 1 dB

Weight : 300g
Overall size: 150 x 65 x 47 mm

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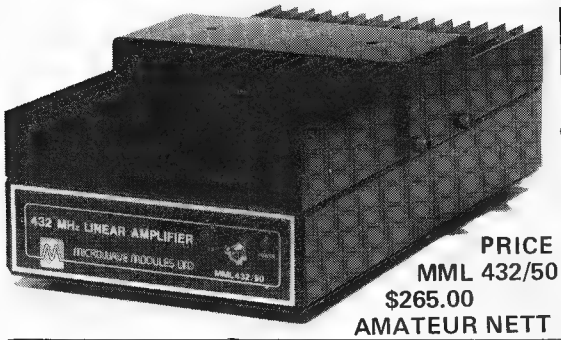

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FEATURES — * 50 watt minimum output, 6dB typical gain * Rugged 145w dissipation PA transistor * Ultra low-noise receive preamplifier * Equipped with RF vox and manual override * Led status lights for power and transmit

SPECIFICATION.
LINEAR AMPLIFIER. **Power profile:** 50 watts typical output for 10 watts input. **Power gain:** 6 dB typical **Frequency bandwidth:** 430-440 Mhz @ - 1 dB **Power requirements:** 12.5 volts @ 8amps for 50 watts output. 13.8V maximum **Quiescent current:** 1amp nominal @ 12.5 volts.
RECEIVE PREAMP. **Overall gain:** 10dB typical. **Overall noise figure:** Better than 3.0dB. **Frequency bandwidth:** 430-440 MHz @ -1dB. **Receive current:** 75mA nominal @ 12.5 volts.
GENERAL. **RF input connector:** 50ohm BNC. **RF output connector:** 50 ohm 'N' type. **Weight:** 4 Kg (8lb. 13oz.) **Size:** 315 x 142 x 80mm (12 3/8 x 5 5/8 x 3 1/8).

MML 144/100
100 WATT LINEAR POWER AMPLIFIER

* 80 watts minimum RMS output 100 watts RMS typical.
* Fully protected against poor load VSWR overheating and excessive or reverse supply rails.
* Equipped with RF VOX and manual override.
* Frequency bandwidth 144 — 148 MHz at — 0.5 dB.
* 10 watts nominal for 80 watts output.
* Weight 4 Kgs. * Size 315 x 142 x 105

PRICE AMATEUR NETT $295.00

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* 100 watts minimum output 10 dB minimum gain.
* Fully protected against poor load VSWR, overheating and excessive or reverse rail.
* Equipped with RF VOX and manual override.
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* 10 watts nominal input for 100 watts output. * Weight 4 Kgs.
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PRICE AMATEUR NETT: $74.00
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MODEL MMD050/500 PRICE: $175

BNC CONNECTORS — Excellent quality, fully imported from U.K. **PRICE AMATEUR NETT: $1.45 each.**

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Following the highly successful and enthusiastically attended 1978 Symposium held in May last year, the organisers are planning another event to stimulate and enthuse. The theme for this year's Symposium will be "Propagation and Circuit Techniques".

The series of lectures and workshops planned will cover the following topics: The coming solar cycle peak; Propagation research in Australia; Long distance VHF work; Practical SSB equipment; Circuit design and analysis using a computer; Amateur microwaves; Amateur applications of microprocessors; Building and using test equipment. A trade display is also planned.

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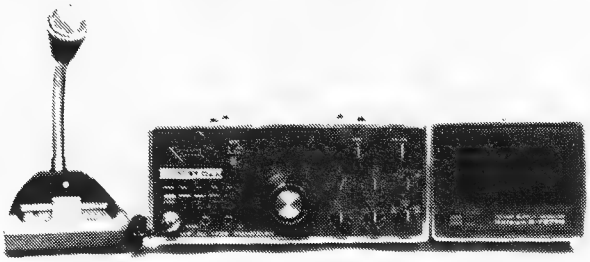

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STOP PRESS

HANDBOOK — WIA STATEMENT

On Wednesday 15th August - after nearly nine months of negotiation - the text of the new "Handbook" was agreed with the P & T Department.
It must be remembered that the Handbook is intended only to set out how the law (in our case the W.T. Regulations) is to be interpreted so far as amateurs are concerned.
Negotiating an up to date interpretation for the Handbook does not mean the law gets changed. This is a much more complex and time consuming job which - as will be explained later - is still being carried on by the W.I.A.
In summary the new Handbook will contain no dramatic changes. Its format has been improved and will (hopefully!) make it easier to understand. As a generality it is less restrictive than the old 1967 edition.
There have been no changes to the amateur frequency allocations and none can be expected until after WARC in September 1979.
Power levels for some modes have eased up slightly and all transmitters, irrespective of mode, will - in future - be rated on RF output and not partly on output and partly on DC input as has been the case for the past 12 years. The SSB output allowance remains at 400 P.E.P. but AM and FM now have a 120 watts output limit.
The ambiguities in respect to mobile operation have been removed and a mobile rig will now (officially!) be considered an extension of the home rig. However, if you want to go /M or /P for more than four consecutive weeks you will still have to make representation to your State licensing people.
The general rules governing the setting up of repeaters have been included as have a set of rules for participation in civil emergencies or emergency practices.
The section on distress calls has been expanded to clarify what you should do if you hear a distress call.
Also included in the appendices are sample papers (in the new format) for Novice and (L) AOCP theory examinations.
Not yet reflected in the new Handbook are several issues still under negotiation and which will require changes to the Regulations before they can become effective. These are:-

(a) Act and Regulation changes necessary to remove the existing ban on anyone (not only amateurs!) listening on unauthorised frequencies.
(b) Act and Regulation changes necessary to remove the existing secrecy provisions as they apply to amateurs.
(c) Act and Regulation changes necessary to redefine "emergencies". The existing law only recognises war as an emergency. Civil emergencies and disasters were not contemplated when the present law was drafted.

Negotiations are still in process to make amateur log keeping optional and not mandatory. This does not require changes in the law.
The W.I.A. has already submitted working papers on the above points and - in broad principle - the P & T Department has no objection to the further liberalisation implied by these submissions.
Finally it must be borne in mind that both the Department and Institute look upon this new Handbook as a temporary document only. The changes that may well come from WARC and the long impending changes to the W.T. Act and its regulations will require a further round of negotiations within a year or so.

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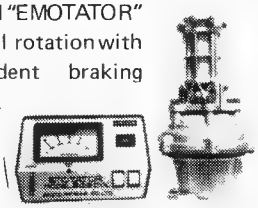

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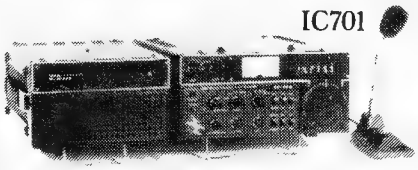

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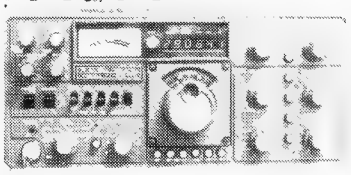

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53.000	VK5VF	Mt. Lofty
144.010	VK2WI	Sydney
144.400	VK4RTT	Mt. Mowbullan
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144.500	VK6RTW	Albany
144.700	VK3RTG	Vermont
144.800	VK5VF	Mt. Lofty
144.900	VK7RTX	Ulverstone
145.000	VK6RTV	Perth
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145.100	ZL1VHF	Auckland
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* Denotes attended operation.

THE MONTH OF JULY

Activity has been somewhat subdued, but this information from David VK5KK will fill you in as to what has happened as we see it from this end.

"DX again relatively quiet from 26-6 to 24-7 across VK1 2, 3, 5, 6 and 7, although some single and double hop Es between those areas plus VK4. Band open to VK2 and 4 from VK5 at 0500Z on 5-7. On 8-7 six metres also open 0000Z between VK7 and VK2. Several VK3s heard on backscatter as well as some VK5s around 150Z. At 0200Z worked ZL1AQJ S2-5. Band shut to VK2 at 0255Z and YJ8PV heard from 0310Z to 0400Z peaking to S3. Also from 0330Z to 0510Z VK4RTL at S9 + but no other station heard except VK4RO. Last signals around 0600Z. On 9-7 similar conditions to VK2 from here around 0430Z. 10-7 to VK4 with Ch. 0 and VK4RTL at 0200Z to 0300Z.

"On 14-7 probably the best Es for July. Band open from 0300Z to 0530Z to VK2 and VK4 with S9 + + signals to Sydney for over an hour from VK5. Also VK3, VK7 to VK2 same period. Es backscatter evident. Es was still there to VK4RTL at 0700Z when 49.750 MHz TV appeared. At 0710Z the TV signals peaked to maximum strength with 49.760 also evident as heterodyne. At 0735Z JA8 signals heard on 50.158, lasting for five minutes. Usual Russian logistics junk between 40 and 48 MHz to 0810Z. Last TV at 0753Z. Obviously double hop TEP still getting to 50 MHz in the very northern parts of VK with Es to help it down here. (Who said TEP only worked around the Equinoxial periods?) Normal midday F2 peaks around 41 to 42 MHz at this QTH to the north. Also single hop to Indonesia/Malaysia to 41.5 MHz with military channels around midday. Very consistent.

"On 15-7 ZL TV from 0330Z to 0500Z on 50.750 MHz. At 0420Z worked ZL1AVZ 5 x 1-2! Band also open to VK7 same period, Hobart area. Es not as strong as day before and favouring lower areas this time. Of course the above represents only part of the conditions as only taken from reports in the VK2 Sydney area and here. However, it was a rather late winter peak in Es this year.

TROPOSPHERIC

"Once again things have been hopping! 24-6-79 proved to be a real hum-dinger across the south-eastern part of VK. To start VK2ZRU (at least) worked VK3AUR (?) on 144 MHz, also VK2YHS, and VK2BQJ worked Chris (of EME fame) on 144 MHz also. Chris is located near Millicent in the south-east and the path to Sydney covers about 640 miles (1015 km). As usual, nothing into the Adelaide area from that distance. The closest was probably Griffith earlier on in June to Adelaide. Other contacts may have occurred but insufficient details. Heard also that VK2YHS worked three VK3s from Sydney.

SKYLAB SCATTER!!

"Nothing has had more publicity, apart from domestice troubles, than poor old Skylab in recent years. Being a victim of unpredicted (six years ago) high sunspot count this cycle it just had to come down, where wasn't really known until minutes before. Gordon VK2YHS (ex VK5ZGV) sent a letter to quite a few amateurs proposing an experiment of sorts with scatter if Skylab should begin breaking up and ionize (most probably around E Layer) the ionosphere within normal range to the layer, maximum about 800 to 900 miles. 144.200 MHz was proposed for 2 metres and 52.050 for 6 metres. In the eventual burn-up, that area occurred around the bottom of South Africa towards the Indian Ocean, but by the time it reached VK6 at 1643Z it was low enough to be seen and heard, i.e. too low. Various 52 MHz beacons from VK6 were watched with a chart recorder but nothing more than random meteor bursts, none of which corresponding to re-entry times. Unfortunately re-entry occurred at a dead-time in scatter (on one E hop range) and in the wrong spot, but one cannot say try again! RIP SKYLAB!

OVER THE SEAS AND FAR AWAY

"Well, while we sit and watch winter go by the Northern Hemisphere plods through its Es season. Without reporting irrelevant and inconsequential details, as far as VK is concerned, conditions have been much the same as they were six months ago. Es is generally low key, although F layer DX is prevalent. JA to W6, W7, VE7 and KL7 on 7-7 and 8-7 via Es. It is interesting to note that on 8-7 and 9-7 we had good multi-hop Es. on 13-7 JA to HS1WR (Thailand). Once again, coincidence, good Es in VK on 14-7 and 15-7. Who knows, maybe similar conditions to ZS from VK6 may exist in six months time as they do now between North America and JA from time to time. It only takes activity to find out.

"A letter from WA9AHZ (WA9ZHG/VK2ZDI) reveals he will have 52 MHz gear portable on Norfolk Island from October 1st to 8th and November 10th to 19th. Good luck, Jack." Thanks, David.

AROUND AND ABOUT

From the WA VHF Group News Bulletin comes advice of a new 70 cm repeater VK6RUF now operating on an experimental basis. Input 433.525, output 438.525 MHz. Deviation standard at present 8 kHz but will be extended to 15 kHz once the correct filter has been obtained. The repeater consists of two PYE 460 UHF base stations, temporarily located at the QTH of VK6CU in Bayswater. Five minutes time out is fitted.

I note also the Wireless Hill Museum is to be opened on 13th October. This Museum has received a good deal of help from the VK6 VHF Group and this column congratulates the workers involved.

Also from the same Bulletin is a "Hints and Kinks" item suggesting a means to cool a 4CX250B without spending a fortune on the proper commercial fan! Obtain a Lady Sunbeam hair dryer and use it as the air source. This drier, with a 9 inch impeller, will deliver a blocked discharge head of 1.6 in. water gauge . . . more than enough to cool that expensive and exotic 4CX250B in your linear .The data sheet for that particular tube states a requirement of only 0.6 in. water gauge.

The same Bulletin tells me that work is proceeding on the tri-band beacon to be installed at Cape Leeuwin at the south-western tip of Western Australia. This beacon will transmit carrier plus ident within the 144, 432 and 1296 MHz amateur bands, and will greatly assist those of you who are interested in VHF DX workings . . . I hope you boys will keep me (5LP) informed of progress and particularly the likely commencement date of operation, so we can give the beacon its due listing in AR.

I note the same people who organised the YBOX DXpedition are planning a similar venture to C21, where they will operate C21AA from 10th to 15th August. Although this will be too late to warn any of you, it is hoped we can publish the results of the venture.

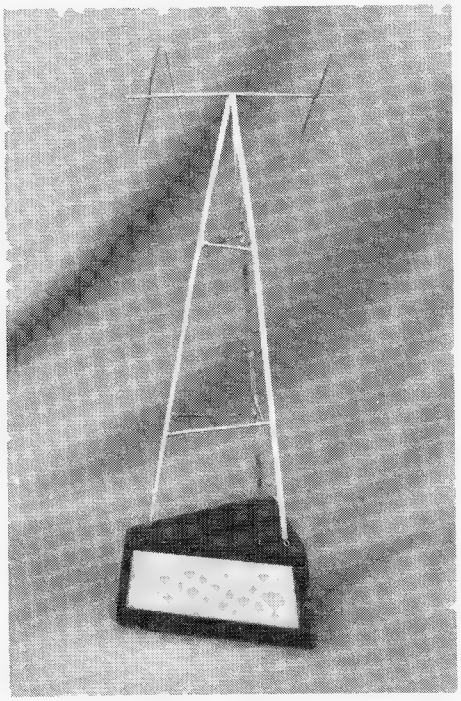
Bill VK2HZ is another we know of who has applied for the SMIRK DXDC 10 countries award. And while on the subject of SMIRK, Ray K5ZMS advises he is working on the establishment of a big trophy to be awarded to the first amateur to confirm 50 countries on six metres! And don't think that is impossible, there are already several amateurs who have worked more than 40 countries, and the way the northern hemisphere is behaving these days 50 is no longer an impossibility. No doubt it will be someone around the Americas who will win the award, as there are so many small prefixes within range.

During late July H44 had been copying YJ8PV and YJ8PD. Ross VK4RO apparently has also been hearing Peter YJ8PD on 50 MHz but not 52, another case where the MUF doesn't rise high enough to make contact.

I note from "QRM" that 432 MHz activity is showing some increase in Tasmania, though mainly confined to Launceston. Kevin VK7ZAH has an 88 element Jaybeam, Daniel VK7DA a home brew stacked 16 element KLM design yagi 70 feet high, and Joe VK7JG uses a 48 element Jaybeam. It is hoped the next few months might see conditions suitable for contacts on that band through to VK5. Unfortunately I have had to reduce the height of my own 16 element KLM type yagi for 432 MHz from 72 to 58 feet to prevent storm damage. The 50 foot tower has been currently holding up a pair of 8 elements on 6 metres, between them an all band log periodic antenna covering 38 to 56 MHz, and above the top 8 element was mounted the 432 beam. The double strength mast was 22 ft. 8 in. out of the top bearing of the tower! All was well until the most recent storms when the mast took on a slight list to starboard, so now it has been straightened, the all band antenna removed to another mast, and the 432 beam placed between the pair of eights. It is hoped this move will allay some of my fears as I watch the assembly swing around in the wind. It may also take an S point of some contacts too, but perhaps that's better than suddenly finding all the antennae up there vertically polarized!

ED ROACHE VHF ACHIEVEMENT TROPHY

The trophy was donated to the Townsville Amateur Radio Club by Ed Roache VK4ZEZ/NER, a very keen VHF operator himself, to recognise North Queensland Amateurs who have demonstrated out-



Ed Roach Trophy.

standing achievement in the field of VHF operation. Ed will be in Townsville for this year's 1979 North Queensland Convention, and will personally present the trophy, which will be awarded biennially at the Convention. This is the first year the trophy will have been presented.

The name of the amateur whose activities have been acknowledged will be inscribed on the trophy, which is made of pure silver on a decorative wooden base. A silver plate on which amateurs' names will appear is attached to the base.

The trophy will be held by the Club in its operating station. However, an appropriate certificate will be given to recipients of the trophy.

GOING SOUTH?

If you are contemplating becoming a VK0 why not take six metre equipment south with you?

The present sunspot cycle has put the possibility of exciting long distance contacts well within the grasp of a VK0 operator.

Amateurs in Australia, New Zealand, Japan and the USA would welcome the opportunity to work you on six metres. Other countries within range are South Africa and the many South American countries.

Certainly you can be besieged by stations eager to work you on any other HF band. But remember that six metres peaks rarely and the coming equinoxes could be the time for you to put VK0 on the six metre map.

Much interesting work remains to be done on six metres and above exploring long distance propagation. Remember the conditions are just about right for some interesting pioneering work on six metres.

Working six metres from a lonely output is no picnic but the rewards are tremendous pioneering new propagation paths. You may even work all continents and that would be quite an achievement.

There may also be new modes to discover and who knows what may yet be achieved.

To aid six metre DX working there is now a liaison net on 28.885 MHz. This would be an ideal spot to arrange schedules so that you could be sure of listeners and could confirm reports of your own transmissions. Without this liaison the contacts from VK-W would most likely not have taken place. So take a rig on 28.885 MHz as well as your six metre rig.

For gear there are many possibilities. The simplest being an IC502 and a suitable linear or maybe a TS700, FT625 or IC511 is more to your taste. A transverter is OK but may be a bind when running liaison on 28.885 MHz.

An antenna may be a hassle but a rugged beam should not be too hard to construct. A spare antenna would be good insurance though.

Help in getting your gear together should be forthcoming from any keen six metre operator and similarly assistance with QSLing should not be too hard to arrange. If you are in a bind don't hesitate to sing out for help. There are many listeners on 28.885 MHz and the keen operators will be only too willing to help.

A good way of getting the six metre beams of the world pointed toward VK0 is to send details of your operation to the SIX METRE INTERNATIONAL RADIO KLUB. SMIRK has a newsletter which publicises such ventures and a letter to the secretary of SMIRK would be well worth while. The secretary of SMIRK is RAY CLARK K5ZMS, and the address is 7158 Stonefence Drive, San Antonio, Texas 78227, USA.

Remember the possibility exists for six metre contacts and there are many stations right round the world who have never worked VK0 on six metres. If you are going there then you are in a unique position to put VK0 on the six metre map.

Overall activity in the south has been limited this month, there seems no point in prattling on, so I propose closing the notes now and leaving space for someone else with better things to say. August, however, should see some improvement in the six metre scene anyway, and September of course should really see things humming. Until then, the thought for the month: "Nothing lays itself open to the charge of exaggeration more than the language of naked truth."

73. The Voice in the Hills. ■

FURTHER SMIRK MEMBERS

The following are SMIRK members who are in the current listing in addition to those listed in May AR.

JA1KXT	3042	JH3CGS	3089
JE1OXB	3140	JH3JWW	3011
JE1QBC	3052	JH3OKY	3012
JI1TQH	3081	JR3OKY	3012
JJ1CKD	3027	JR3LSE	3053
JJ1HKK	3091	JH4SQJ	3076
JJ1OGP	3124	JH4SSP	3093
JJ1RAP	3136	JH4WEU	3050
JJ1SHW	3080	JA5WWY	3134
JJ1SQZ	3099	JH5BYX	3059
JK1HCE	3039	JR6OST	3097
JK1NUH	3082	JR6OTM	3115
JK1OVI	3073	JR6SVM	3043
JK1PEC	3022	JR6TCT	3094
JK1RWC	3063	JA7FVA	3122
JK1UPA	3026	JA7KYW	3077
JL1CSD	3138	JA7NVF	3028
JR1FTJ	3139	JA7ROK	3074
JE2KCR	3049	JH7XDU	3084
JE3KKC	3051	JH7XWA	3075
JF3BTR	3038	JA9QYC	3078
JF3DWO	3054	JA9WRM	3029
JF3NUX	3092	JA0PHR	3135
JF3OLO	3045	JA0SZX	3010
JF3PQD	3071	ZL1AVZ	3131
JF3SRA	3114	VK2BMX	3120
JF3WNR	3037	VK3AUI	3041
JF3XEX	3044	VK3AWY	3023
JG3AVO	3137	VK3NM	3067
JG3DDX	3123	VK4ZJR	3003
JG3EFC	3072	VK5AVQ	3005
JG3FFP	3013	VK6ZCC	3119

Compiled by Lionel Curling VK3NM. ■

20 YEARS AGO

SEPTEMBER 1959

It was about twenty years ago that the first Bass Strait Ferry went into service. Not slow in coming forward, Max VK7MX described some of the sights to be seen at the VK7 end of the journey. Naturally Max suggested that the portable gear should go along.

While on the subject of portable gear the revised rules of the National Field Day Contest were published, along with an Editorial comment on why we should all be in it.

September was a good month for technical articles. Tropospheric propagation at VHF was discussed by Alan Elliott VK3AEL.

Bud Pounsett VK2AQJ described a high tension power supply with a variety of protection and control circuitry incorporated.

Simple Sideband. A multi-part article by Lester Earnshaw ZL1AAX covered all aspects of SSB circuit design. This one, an all-band heterodyne unit

How Good Are Your RF Chokes? Hans Ruckert VK2AOU showed the methods for designing, testing and winding your own RF chokes. Excellent reading now as then.

Meet the Other Amateur and His Station featured Andy Roudie VK3UJ, complete with AR88 receiver and transmitter with Geloso VFO.

In his second article for the month, Hans Ruckert looked at the possibility of using 12 volts of high tension on standard receiving tubes.

Build your own 14 inch TV set. Q-PLUS were advertising a complete kit with easy to follow instruction manual. The price, only $200. Times have changed. ■

INTERNATIONAL NEWS

CHINA AND BANGLADESH

IARU Headquarters has the news that there is a newly-formed Association of Radio Sport in the People's Republic of China. Officers of the Society were elected in Peking during March 1979. In the same issue of the Calendar there is news of the formation of the Bangladesh Amateur Radio League.

TONGA

The Amateur Radio Club of Tonga was elected as the 105th member of IARU. Two more Societies have applied for IARU membership. These are the Cayman Radio Society and the Fiji Association of Radio Amateurs. ■

QSP

Ex-G RADIO CLUB

The ExG Radio Club, Australian Chapter, is managed by Steve VK5ZB, QTHR. This club is for amateurs born in the UK and living abroad. Local nets are at 12.00Z on Monday and Friday on 14.344 MHz, 10.00Z on Thursday on 3.622 MHz, and 04.00Z winter (05.00Z summer) on Saturday on 14.346 MHz. This is their 20th anniversary year. ■

BLUE BOTTLES AND RED FACES?

Wonder how many amateurs got their national news and music on 40 metres one sunny morning in the last week of June. Gentleman providing this unusual service apparently left home in a hurry with rig and mic. switched to transmit. Much consternation when he returned for lunch and found XYL with domestic receiver running full bore alongside the Tx! ■

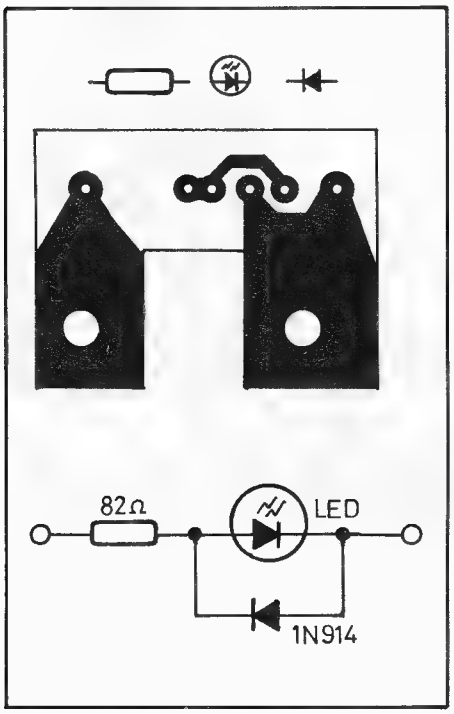
Join the I.W. net at 2300Z on Thursdays on 14165 kHz when you have intruder information.

TECHNICAL CORRESPONDENCE

The Editor,
Dear Sir,

I refer to the "Soldering Hint" in Novice Notes at page 30 of the March issue.

I have been using the dial lamp across the secondary of the Scope transformer for some time, and have found it very helpful. The only problem that I have encountered is that it is very fragile and easily smashed, particularly when I have to take the iron to the job instead of the other way around. I am now using a LED in the circuit below, mounted on a PCB which fits over the 3.3 volt connecting screws on the transformer. (My transformer is the A-R with the vertical separator.) The PCB was coated with resin after etching then the areas around the mounting holes were tinned to give good electrical contact. The dip in brilliance of the LED is not so pronounced as with the globe, but it still occurs.



Circuit and PC Board.

Incidentally, don't say to yourself (as I did) that the transformer puts out 3.3 volts, therefore a "3 volt" torch globe is suitable. It burns out very quickly.

Yours sincerely,

J. D. Laidlaw VK3ZTA. ■

☆ ★ ☆

Dear Sir,

Many of the TVI filters available are of unknown quantity. In ascertaining which one I should purchase I undertook some intion loss measurements on the Drake TV-42-LP (model 1605) filter. This unit is stated by the maker to be a four section filter with a cut-off frequency of 43.2 MHz with a rating of 100 watts. I enclose a copy of the results as I believe they may be of interest to other amateurs. Although the measurements were not taken at the rated power all inductors are air-cored so there should be very little variation in performance.

I have now used this filter for quite some time and have had no interference problems. I live in a TV fringe area and the amateur antenna and TV antenna share the same tower and coaxial lines.

Yours faithfully,

Malcolm R. Haskard VK5BA.

INSERTION LOSS MEASUREMENTS ON DRAKE FILTER TYPE TV-42-LP

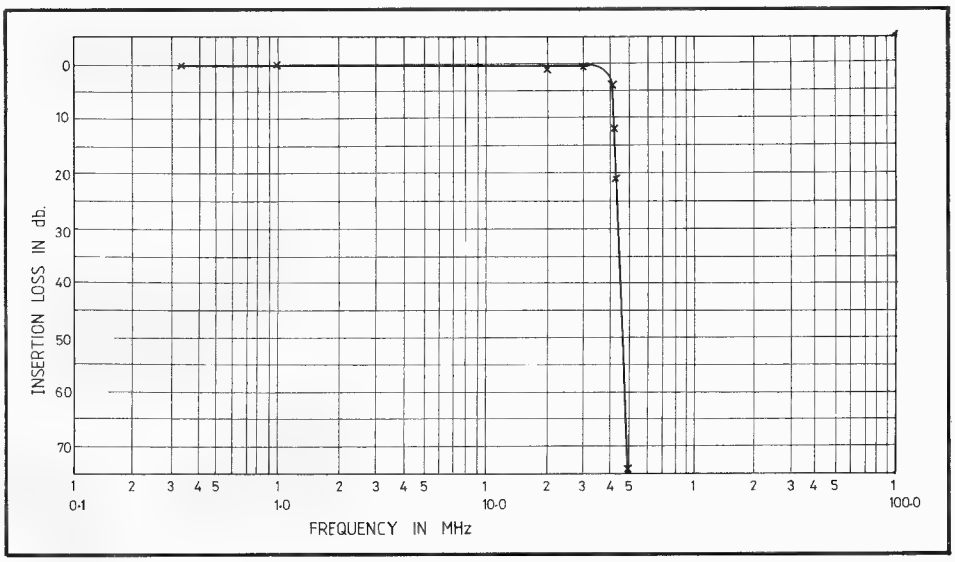
Equipment used: Tektronics constant voltage generator, type 191; Termaline 50 watts, 50 ohm load, type 8085; Voltohmyst with crystal probe, type 2A 56074; Hewlett Packard RMS voltmeter, type HP 3400A.

Results: A 2 volt signal was fed from the 50 ohm output of the generator into the filter which was terminated with the load. The voltage, V, across the load was measured and the insertion loss calculated from:

Insertion loss 20 log (2/V) dB.

Frequency MHz	Insertion Loss dB
0.35	0.0
1.0	0.0
3.0	0.08
10.0	0.08
20.0	0.18
25.0	0.66
30.0	1.18
34.5	0.38 (peak)
35.0	0.39
40.0	1.84
42.0	3.40
43.0	12.0
44.0	21.6
50.0	74.6
Greater than 50	Too great to measure

■



GRAPH

SUPPORT OUR ADVERTISERS

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

PO Box 404,
Casino 2470, NSW
21st June, 1979

The Editor,
Dear Sir,

I take the opportunity to extend to you my gratitude for placing our "Worked Australian State Police" Award in your magazine. The Award has really taken off and has been nick-named the "Flatfeet Award". We hope to make a donation to the Australian Cancer Society shortly, as a result of profits made from the Award, and we will inform you of the date. You may like to put a paragraph or two in the magazine.

73. Lance Ferris VK2NVF,
Member WIA, WASP Charter Member.

Editor's Note: Yes please, Lance, let me have the details of the donation in due course.—VK3UV. ■

The Editor
Dear Sir,

"INTERNATIONAL CORRESPONDENCE"

Like possibly many of you have considered doing, I once looked into the matter of importing some amateur radio equipment direct from overseas.

Without commenting specifically on the advisability of such action I would, however, like to share with you the benefit of one of the replies received to my series of enquiring letters.

I can assure you that this is a true case. In fact the editor may care to authenticate this, as I have forwarded to him in confidence a photo-copy of the letter which, under the particular firm's letterhead, reads as follows:

"Tokyo: 22nd October 1978
Dear: Mr. Ian J. Hunt.

We thanking you for your letter on your dated of 16th, Oct, Which we received recently on this

letter, However, we shoudl it replying to you on this matter, We was shipped with his excess bagagge clam to shipped from us, But, that's the moment which was lucky to got the unit, Then, We shipped to him. Except, When it this moment, very hard to get the unit of the mentioned. TRIO TS-520D with External VFO, We are very still those units are shortage, Therfore, when it will be getting those unit, Even we don't know when.

So, we should replying to you in this matter as same moment to our agent in Sydney, as foollowin you, So, Please contact with him, May could be should take care of this moment and much recommendable to advicing from him.

We sorry about your requirement, Except we couldn't do hundred per cent with your requesting in this moment, as so much we regreting with you. Even the Mr, XXX telling to you the Hows about the supplying to unit in Japanese situation, Should new it this happen, So, we would like to be understanding this matter. Much thanking for your fine cooperation and trying to understanding in this case.

Best Regarding Yours.
(Signature)
Tokyo, Japan."

I did finish up purchasing the equipment from an Australian agent and was quite satisfied as a result.

Whilst the above letter is no doubt most amusing to us, just ponder as to how you would manage to write a business letter to someone in Japan "In Their Own Language".

Ian Hunt VK5QX.

EDITOR'S NOTE:
Yes, Ian, the letter is genuine, and I thought I was having trouble on 15 metres!!—(VK3UV). ■

The Editor,
Dear Sir,
I cannot keep this piece of good news to myself, so here is a challenge to find a younger member of the WIA than Associate Member Ian Wesley Foster, of Nicholson, age three weeks!

When I heard the news that this much desired Jnr. Op. had safely arrived, I asked his proud father, Ian Snr. VK3ST, "Has he joined the WIA yet?".

Reply, "Not yet, but won't be long".

So yesterday, upon a visit to the shack of VK3ST to see the nice little fellow, Ian Snr. produced the membership application form with cheque attached, with a request — please second it.

So it will go to the Council on Wednesday 30th, and there's no doubt they will accept our youngest member.

In a few years time I predict the lad will be our youngest Novice!

Yours faithfully,

K. V. Scott VK3SS. ■

The Editor,

Dear Sir,

I refer to the mention in the Federal tape broadcast from VK2AWI on Sunday, 8-7-79, concerning paper quality and costs of AR.

I would agree with Bill Roper's remarks about polished paper and would suggest that paper of the quality used in the 60s was quite suitable with a cover of polished paper.

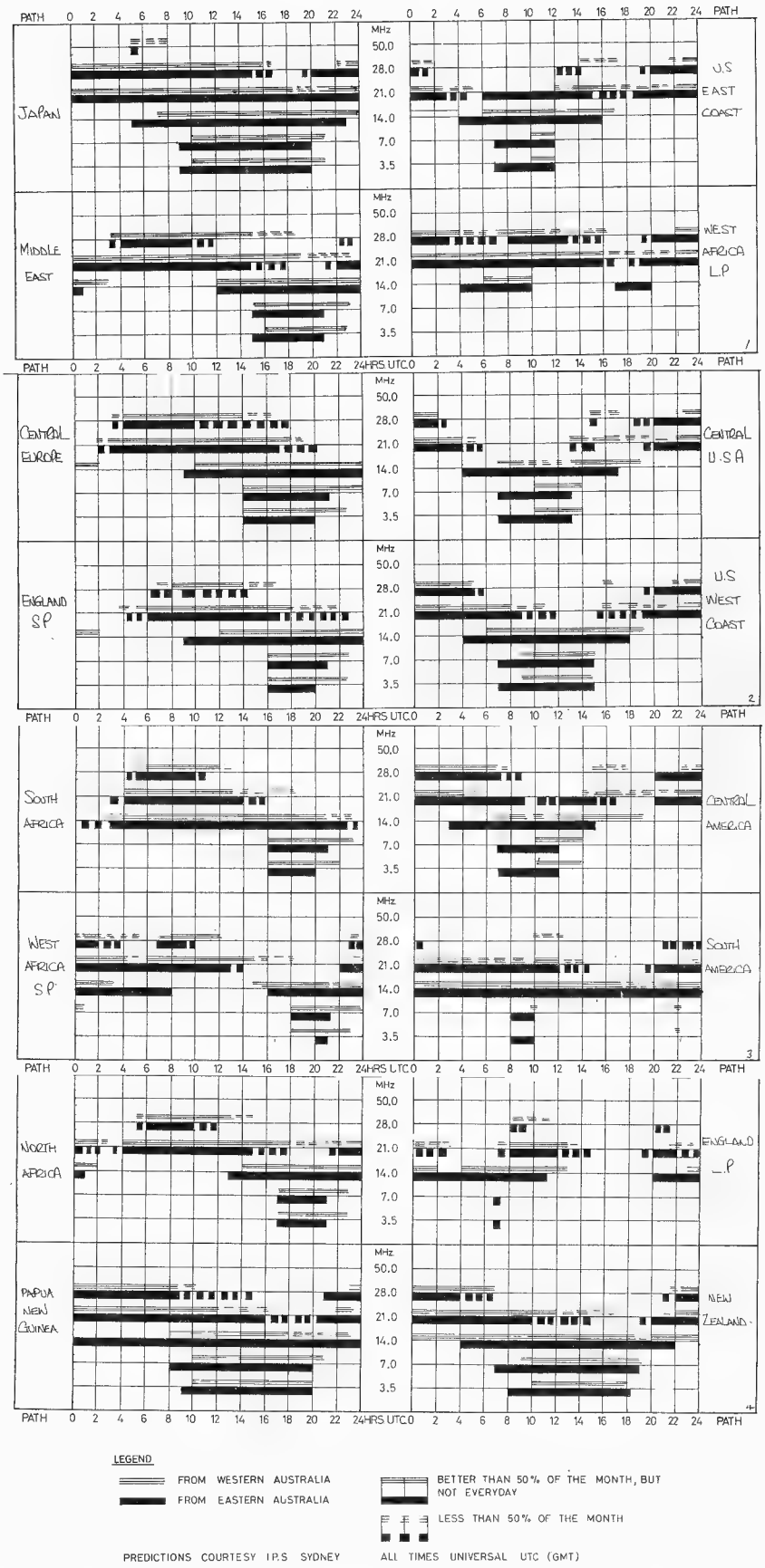
I would also suggest that the envelope is also an unnecessary expense, witness the number of publications now using a simple wrapper, which must cost less than an envelope. After all, AR usually arrives doubled in half anyway.

Allan V. Bull VK2FB.

EDITOR'S NOTE
Different paper is now used for inside texts. Most members appreciated an envelope for AR instead of the wrapper used several years ago. Perhaps a re-appraisal may now be nesessary. What do other members think? ■

IONOSPHERIC PREDICTIONS

Len Poynter VK3ZGP/NAC



AMATEUR RADIO — VIDEOCASSETTES
Is your Club or Group looking for high class promotional material for amateur radio?

Ask your Division for the loan of videocassettes in colour. Titles available now are:—

"Amateur Radio the Natural resource of every Nation" (6 minutes).

This was specially produced by VK5KG, the Federal Videotape Co-ordinator, for the CCIR Seminar in Sydney.

"This week has 7 days" (25 minutes).

ARRL films (60 minutes in all).

"ATV in Australia 1978" (30 minutes).

"VK5 ATV History" (30 minutes).

"VK5 — official opening of Burley-Griffin Building" (60 minutes).

"G6CJ Aerial Circus" (90 minutes). On special loan ONLY.

Also, a service exists for copying any of these titles (except G6CJ Aerial Circus) on your own cassette — you pay postage both ways.

CLUBS — Why not start your library now, write to your Division or direct to VK5KG.

NOTE — Educational tapes are now being considered but please wait for an announcement in AR.

YOU AND DX

Mike Bazley VK6HD
8 James Road,
Kalamunda, W.A. 6076.

The one advantage I have in writing this column is that I can express my point of view first! With the approach of summer the band becomes full of stations swapping numbers, on certain weekends the phenomena is on Phone and CW simultaneously. The contest season approaches! No I'm not against contests, in fact I get a lot of pleasure from them; mainly because it brings stations on to the LF bands who normally would not operate on those frequencies. My gripe is that a major Phone or CW contest takes over the bands completely. I do beleive the contest organisers have a duty to see that their contests do not spoil the activities of non-contestants. For example, I would suggest that no CW contestant should operate above 14050 kHz or no Phone contestant should operate outside 14150 to 14250 kHz. Could the VK/ZL contest organisers be the first to set the trend with band frequency limits for their contests?

DX NEWS, RUMOURS, FACT AND FICTION

Listening around the bands one hears a lot of rumours. If you are like me you make a note of the call and date and hope that some of these rumours do materialise. Looking back over the past 20 years, some countries become easier to work, others harder, but all DXCC countries eventually turn up. So if you hear an unusual call, work it, or if you think that the BY is not genuine, work it. I always remember the first time 7GIA came on the air, he was branded a pirate, until the QSLs started to come through. With doubts in mind the following notes are offered on a "perhaps" or "wait and see" basis! Rumours, fact and fiction.

VE3FXT will be travelling to Burma in December. Call sign unknown but a licence to operate on a spot frequency is likely. The frequency? 21,225 kHz. George is supposed to be working in Burma for the next two years up to the end of 1982. If this one materialises it will take a much needed country off the wanted list.

CE0ZN has been worked/heard on 14195 and 14025 around 2300 GMT onwards.

9U5AN still QRV Burundi, around 14220/225 kHz. QSL via OZ9DX. Has been heard at 0030 GMT and also at 2030 GMT

Do not write China off the DX map. Lots of visits to BY are, and have been, made by amateurs recently. There are behind the scenes moves to try and get a club on the air. Plans are similar to those that brought YI1BGD on to 20 metres. Patience will be rewarded!

Dave Schoen N2KK and Scotty Meadows K5CO plan an extensive series of operations in the Indian Ocean and African areas starting later this year and running for about three months. Dave, who holds licences F0CGP, FR0CGP, FH0CGP and 3V8KK, will be signing J28 in the CQ CW DX contest and will then move to Reunion FR7 around December 1st. It is anticipated that K5CO will join N2KK at Reunion and, depending on available transport dictating the order of stop, it is hoped that activity will be possible from FR7/G, FR7/J, 3B7, 3B8, 3B9, FH8 and D68. Dave already has written permission from the French Government for operation in this area. There are plans for plenty of activity, especially on 40, 80 and 160 metres.

Do you object to paying the Post Office money for the renewal of your licence? If you do then do not go to live in the Seychelles. Licence renewals are currently 82 dollars US per annum!

Rumour has it that a VE3 station should be operating from TN8 during the month of September. Suggest one keeps checking those DXpedition frequencies.

701, VS9K and 8Z4 are all rare countries and are on most people's wanted list. Rumours have it that a group of Europeans intend to activate one of these spots during CQ Phone contest, i.e. October, possibly following up with another spot during CQ CW contest. I'm keeping my fingers crossed as I need all three!

It is reported that V5ABK has permission from the government in CR3 land to operate from Guinea-Bissau for two weeks in December and that he will be there from the 1st December. Apparently all formalities have been completed and it only needs the operator and equipment to get this one active. QSLs via G3LQP.

You never know where Erik SM0AGD will show up from next. Last time heard Erik was satisfying the hungry hordes from SM0AGD/XW8 on 20 and 15, CW and SSB.

September 30 will see the end of the KZ5 prefix from the Canal Zone. After that date ex KZ5s will have to apply for a HP licence. Another country lost.

The special prefix of GT was being used by Isle of Man stations during July to mark the 1000th anniversary of the Isle of Man Parliament. QSL information: substitute GD for GT, i.e. GT4BEG is GD4BEG.

Don't ignore those LF bands. I do not know how conditions are in the East but here in the West 80 CW has been providing, on some occasions, pleasant DX surprises at sunrise and sunset. Whilst listening on 40 SSB Peter VK6NFX has been noting such goodies as C6ANR, CT2CQ, OK3TAB/D2A, D4CBS, EA8OZ, FM7WS, K7CA/HC1, HI3JEI, HH2T, TU2AH, VP2MAY, XT2AT, 3A2EE and 5N0AAS. Just to name a few from his list, all 7070-7100 kHz, 2300 to 0100 GMT.

Conditions on the LF bands should really improve during September/October; be prepared! An inverted vee antenna can really work wonders.

Rumours again. A group of VEs and Ws have applied for permission to operate from St. Paul Island (the VE one), some time in the future. A suggested date is the CQ Phone contest in October.

For the DX chasers on 160 metres, Russian stations are now permitted to operate in the frequency range 1850 to 1860 kHz. UA3CD, 3CH, 3DNB and UT5AB have all been reported as being worked by G stations. It is also reported that there is activity from UF6, UG6, UJ8 and UP2 stations on this band. Best time of year for VK to QSO this area should be around January or February at our sunrise.

The HF bands have also been providing some useful DX. Murray VK4KX reports working/hearing SSB, CE0ZN, VR1BE/KH1, KH6CW/KH7, XF4MDX, ZD7HH, 4U1UN, 9K2DJ/8Z4 (Abdul QRV only for 24 hours QSL via home QTH), and on CW FP8HL, FG0DDV/FS, VR3AR (28 MHz), XF4MDX (28 MHz) and 3B6CD.

CR9AJ, Torres, has now left Macao and is back in Portugal as CT1ADP. This means that CR9 will now be without a resident amateur.

YI1BGD is still being reported as active between 14200 and 14250. Either around 0730 or 1400 GMT. By the way, has anyone received a QSL from YI4SC?

Many thanks to those people who advised 6HD of the QSL information of FG0DYM/FS7. This one is via W3HNK.

KP4AM/D QSLs are now being received and this one has had the approval of the ARRL. Also reported as being received by some of the lucky ones are the 1S1 DX QSLs.

Nets again! 6HD is not a regular check into nets, generally preferring to chase DX on the CW mode, but the amateurs who enjoy their hobby through net operations should be allowed to do so. Even if I'm not completely in favour of nets I most emphatically **do not** agree with the actions of certain stations who deliberately cause QRM on the net frequencies by swishing VFOs, playing recordings of the Russian Jammer or other such means. If stations wish to congregate in nets, why shouldn't they? Those who do not agree with nets must agree that by bringing a large group on to one frequency it is reducing the QRM level on the rest of the band. It is suggested that if you have strong views on this subject why not put those views on paper and send a letter to the editor of this magazine.

Thanks to VK3NDY, VK4KX, VK5WV, VK6AJ, VK6CT, VK6LK and VK6NFX, also to G. Watts News Sheet, The Long Island DX Bulletin, and The West Gulf DX Bulletin. My deadline for the November issue is September 24th. 73 es DX Mike K6HD.

QTHs YOU MAY HAVE MISSED

A7XAH — via DJ9ZB.
CO7RCB — Box 52, Camagugy.
D4CBS — Box 101, Praia.
FG0DDV/FS — via W2QM.
FH0OM — via DJ1TC.
FK8CR — via W7OK.
FK8DD — Box 3040, Noumea.
FM7WE — via K4FJ.
FP0PV — via WA2PVV.
FR7BU — Box 32, St. Paul.
FW0WW — via W9GW.
GT6UW — via G6UW.
HC5EA — via K8LJG.
HK0BKX — via WA6AHF.
IH9ZYP — via I8YGZ.
J3ABP — via K5KG.
JA8AQN/JD1 — via JA8JL.
JF1IST/7J1 — via JA1HQG or JA1NRH.
JW7B — via LA1QK.
JY8BF — via K4BF.
OY5J — via WA3HUP.
TG4NX — via WD8MOV.
VP2MBS — via VE1ASJ.
VP2MX — via VE1ASJ.
VR1BE — via N6ADL.
XF4MDX — via XE1OX.
YS1RRD — Box 32, San Salvador.
ZB2EY — via DL5NJ.
ZD8RG — via K8VIO.
ZF2CN — via WB4AXN.
3B6CD — via 3B8CD.
3B8BZ — Box 467, Port Louis.
3D6BW — via K2IJL.
5B4HF — Box 4180, Nicosia. ■

OKINO-TORISHIMA DXPEDITION

The Okino-Torishima DXpedition had 5500 QSOs with 70 countries over four days of operation. Originally a ten day operation was planned but due to very heavy seas and dangerous conditions the operation had to be limited to four days.

The operators returned to Japan on 23rd June after four days of operation. The operation was under difficult conditions as can be seen from the photographs.

Sort of makes even the worst VK Field Day look like a picnic.

Information provided by S. Hara JA1AN, President of the JARL.

In due course an 8 mm film of the DXpedition will be edited from film taken. ■

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Syd Clark, VK3ASC

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The Federal Arc Transmitter; Watt's Current; Eavesdrop on RTTY; Repackaging the GLB Synthesiser; Electrical Shock; The Viking 5; Adding 160 Metres to the Heath SB-220; All About Kits: Tools and Equipment you'll Need; A 1935 Style DX Tx for Twenty Dollars or Less; QSL Cards, Part 2; The Ins and Outs of the Washington Scene; Confessions of an XYL; Communications a New Concept in Education and Community Services; CQ WW WPX/SSB Contest.

CQ MARCH 1979
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CQ April 1979
Wideband Modulation (WBM) Techniques; Build Your Own MP-80 Morse Code Keyer, Pt. 1, Basic Theory of Operation; A Breadboarding and Interconnection Scheme; A Solid-State 3.5/7 MHz VFO for the K8EEG Viking-5 Transmitter; The Yaesu FL-2100 Linear Amplifier (Review); All About Kits, Part IV, If It Doesn't Work; RF Power Transistors and Amplifiers, Their Care and Feeding, Part II — Servicing and Trouble Shooting; Antennas: The K6VQ Antenna Tuner and the UA3IAR Quad; A Compact 4 x 4 Array for Home or Field Day Use; Mobile Autopatch Operation — Safety First; 1978 CQ WW DX Contest High Claimed Scores; 9 Projects for Under $9; The DJ is a Robot; A Data Retrieval Program — in Basic.

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FROM THE OVERSEAS ADS

Trio Kenwood have released a dual-band 2 metre and 70 cm transceiver the TS770. This is a multimode transceiver on the lines of the TS700 and TS600. Features include dual VFOs, digital readout and scanning as well as the two band coverage.

FDK have a new 70 cm transverter, the MUV430A.

Icom have a 432 MHz version of their popular IC280. This 432 MHz rig is called the IC370 in Japan.

Alinco have a range of towers, power supplies and linear amplifiers. The linear amplifiers give up to 50 watts output and are available in both 6 and 2 metre models This should mean some bigger signals from Japan in the coming openings. ■

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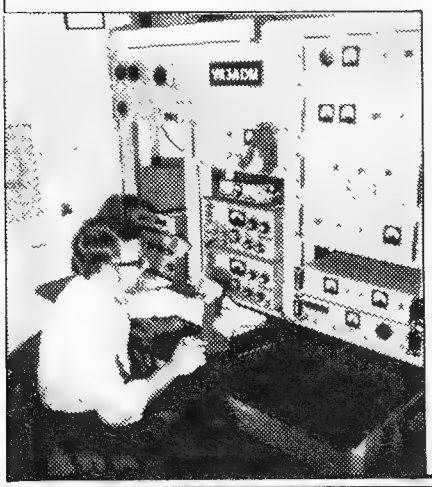

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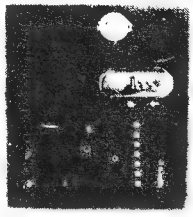

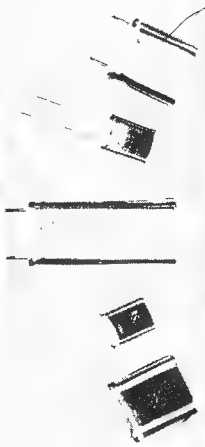

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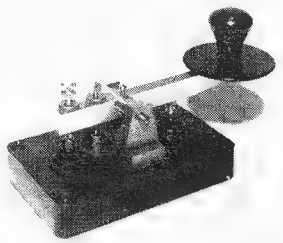

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90 day warranty and technical/spares support.

IC551 Specifications: ☐General. Number of Semi-conductors: Transistors 51. FET 13. IC (includes CPU) 30. Diodes 114. ☐ Frequency Coverage: 50 — 54MHz. ☐ Operationable Temperature: — 10°C — +60°C (14°F — 140°F). ☐ Frequency Stability: Less than ±500Hz after switch on 1 min to 60 min, less than 100Hz per 1 hour after 60 min, and less than ±1KHz in the range of — 10°C to +60°C. ☐ Antenna Impedance: 50 ohms unbalanced. ☐ Power Supply Requirements: 13.8V DC ±15%, negative ground, or 117V/240V AC ±10%. ☐ Power Consumption: Receive at min. audio level DC 0.9A AC 35W. at max. audio level DC1.1A AC41W. Transmit in SSB/CW modes DC 3.3A AC 98W. in AM mode DC 3.0A AC 92W. in FM mode DC 3.3A AC 98W.
☐ Dimensions: 111mm (h) x 241mm (W) x 311mm (D). ☐ Weight: 6.1 kg. ☐ Transmitter. Emission Modes: A3J SSB (USB/LSB). A1 CW. A3H AM. F3 FM. ☐ RF Output Power: SSB 10W PEP (1 — 10W adjustable). CW 10W (1 — 10W adjustable). AM 4W (0 — 4W adjustable). FM 10W (1 — 10W adjustable). ☐ Modulation System: SSB/AM Balanced modulation. FM Variable reactance frequency modulation. ☐ Max. Frequency Deviation*: ±5KHz. ☐Spurious Emission: More than 60dB below peak power output. ☐ SSB Carrier Suppression: More than 40dB below peak power output. ☐ SSB/AM Unwanted Sideband: More than 40dB down at 1000Hz AF input. ☐ Microphone: 600 ohm dynamic or electret condenser microphone. ☐ Receiver. Receiving Mode: A1 (CW), A3J (USB, LSB), A3H (AM), F3 (FM). ☐ Receiving System: SSB/CW/AM Single Superheterodyne (Triple Superheterodyne when Pass Band Tuning unit is installed). FM Double Super heterodyne. ☐ Intermediate Frequency: SSB/CW/AM 9.0115MHz. (When Pass Band Tuning Unit is installed: 2nd IF: 10.75 MHz, 3rd IF: 9.0115MHz). FM 1st IF: 9.0115MHz, 2nd IF· 455KHz. ☐ Sensitivity. SSB/CW/AM Less than 0.5 uV for 10dB S N/N. FM More than 30B S+N+D/N+D at 1 uV. ☐ Spurious Response Rejection. Ratio: More than 60dB. ☐ Selectivity: SSB/CW/AM More than ±1.1KHz at — 6dB. Less than ±2.2KHz at — 6dB. (When Pass Band Tuning Unit is installed: less than 1KHz at —6dB). FM more than ±7.5KHz at — 6dB. Less than ±15KHz at —60dB. ☐ Squelch Sensitivity. SSB/CW/AM 1 uV. FM 0.4uV. ☐ Audio Output Power: More than 2 watts. ☐ Audio Output Impedance: 8 ohms.

Check it out at your VICOM dealer.

VICOM

VICOM 68 Eastern Road
South Melbourne Vic 3205
Ph (03) 699 6700
Telex AA 36935 PROVIC

Amateur Radio Division.

AWARDS COLUMN

Bill Verrall VK5WV

7 Lilac Ave., Flinders Park, S.A. 5025

Here is a summary of WIA Awards issued during the period 1st January, 1979, to 30th June, 1979, and the top DXCC scores, new members and amendments as at 30th June, 1979.

WAVKCA AWARD

Cert. No.	Call Sign	Cert. No.	Call Sign
744	PA0MOD	763	9H4L
745	JA3BRB	764	JE2CGR
746	JA3CMD	765	DP2UU
747	JA6RIL	766	JA3FEG
748	JA3XRC	767	JA7ZP
749	JE1CTA	768	JH1IAQ
750	JF1SEK	769	JA5PUL
751	UL7CT	770	JA3VXH
752	UA0NH	771	JA4BCW
753	UW0MF	772	JA3DXD
754	UA0LS	773	JA6OTW
755	F9KP	774	JA4ESR
756	JA6WW	775	JH2CJW
757	JA7WMO/JA1	776	JH0CAZ
758	JA2UYS	777	OK3JW
759	JA3CSZ	778	YU1NEO
760	JH1QOJ	779	JA2IDN
761	G3GSZ	780	JH8JIB
762	JA6RIL		

WAVKCA (VHF) AWARD

12	VK2ZHF	13	VK2ZAY

WAS (VHF) AWARD

126 VK7MC
127 VK2ZBD
128 VK3AWY, plus 7 additional countries.

Amendment:

123 VK2BYX (ex VK2YDY), 12 additional countries.

VHFCC AWARD

100 VK2ZAY

HAVKCA AWARD

40	UA6-108-33	42	UA3-142-1
41	UA9-154-549	43	UB5-065-177

DXCC — TOP LISTINGS

PHONE

VK6RU	318/359	VK4RF	292/300
VK5MS	315/355	VK4PX	290/304
VK4KS	313/343	VK4VC	288/297
VK6MK	309/344	VK3JF	282/292
VK5AB	302/330	VK7DK	279/292
VK6LK	297/310	VK4AK	273/280
VK4FJ	296/331	VK2AAK	269/281
VK3AHO	295/326	VK3ACD	269/281
VK2APK	294/313	VK5WV	269/279
VK4UC	294/306	VK3AMK	269/276

CW

VK2EO	310/346	VK4KX	259/270
VK2QL	303/340	VK3YD	251/281
VK3AHQ	300/331	VK3RJ	247/272
VK3YL	295/325	VK3TL	242/260
VK4FJ	292/333	VK3KS	236/254
VK2APK	284/304	VK3JF	209/222
VK3XB	273/300	VK5RX	203/231
VK4RF	272/291	VK4DO	201/224
VK3NC	262/297	VK7LZ	200/229
VK6RU	259/296	VK4SD	187/206

OPEN

VK6RU	318/359	VK4UC	297/310
VK4KS	313/347	VK3AHO	295/326
VK4SD	310/339	VK3JF	294/312
VK6MK	309/344	VK2SG	294/311
VK2VN	303/336	VK3XB	279/306
VK3YL	303/333	VK4AK	274/282
VK2APK	302/329	VK3TL	273/293
VK4FJ	301/343	VK3ACD	269/282
VK4RF	301/323	VK3AMK	269/276
VK4PX	297/315	VK2AHH	268/292

DXCC — NEW MEMBERS

PHONE

Cert. No.	Call Sign	Tally
173	VK3OT	200
174	VK6VW	100
175	VK9AC	110/113
176	VK3AKK	243
177	VK3DS	128/133
178	VK3NDY	121
179	VK6NAN	101

CW

103	VK3NDY	121
179	VK6PY	101/103
104	VK3AYO	107

OPEN

168	VK3NDY	122
169	VK3AVO	99/101
170	VK6NCD	101

DXCC AMENDMENTS

PHONE	Tally	OPEN	Tally
VK5WO	226/243	VK5WO	257/279
VK3GB	189/206	VK7BC	228/230
VK3DU	150	VK3AXQ	138/142
VK6HE	241/243		
VK4CZ	258/264		
VK4PJ	173/176		
VK6NCZ	134		
VK2APW	200		

Good hunting. ■

WICEN

Ron Henderson VK1RH

Federal WICEN Co-Ordinator,

53 Hannaford St., Page ACT 2614

Ph. (062) 54 2059, A.H.

PLANNING A WICEN EXERCISE

The starting point for any activity is an aim which must be specific, concise and achievable, e.g. to exercise the Bungendore WICEN group in formal message handling.

Having due regard for local terrain, weather, numbers of operators expected and equipment available, it is next best to select a time, duration, location and frequency band for the exercise. For example, 0900 to 1300 Sunday, using 2 metres VHF along the Molongolo River. From this a scenario can be painted, it need only be a paragraph or so, to portray a possible situation in which your group may become involved, i.e. river flood height reporting.

The exercise director or controller can now ghost out a sequence of events covering the proposed exercise duration and devise exercise traffic, often as pre-printed formal messages with associated release times.

Consideration should also be given to administrative matters such as publicising the exercise to members, meals, and Radio Inspector clearances (see him early to determine his needs!).

Briefings can be given either at a central site before moving out or on the air. Briefing should be thorough and include enough information to allow each outstation to draw up a net diagram complete with call signs and locations.

Personal experience has shown that a 6 to 8 station net with inexperienced operators can handle 3 to 4 "send" messages per station in a half day using 2 metres FM simplex in good operating conditions.

In conclusion, do not forget the post exercise debrief or "wash-up", this must be held as soon as possible yet with ample time allowed for individual comments. Consequently it is often best not to hold it straight after the exercise, but a few days later, possibly as a "social" (coffee house) gathering. Do not neglect the AR publicity aspects and keep your divisional WICEN co-ordinator informed of your activities.

FEDERAL NET ACTIVITIES

As a result of failing interstate communications arising from the Telecom employees' industrial action in mid-July a Federal WICEN network was activated. The net reported in for about a week and tested both SSB and RTTY communications each evening at 0800Z.

Activities in the States differed from State to State, but at least one State WICEN group was placed on standby by their emergency authority, the police.

Whilst little traffic was passed, possibly only one or two messages, the regular tests demonstrated WICEN's capabilities which were advised to the Natural Disasters Organisation, our liaison link with the emergency communications committee set up by the Prime Minister and chaired by Senator Guilfoyle. Obviously the lack of traffic was due to the Government policy of waiting until serious breakdowns were evident before invoking emergency services. Despite this, WICEN has demonstrated its ability to meet a request if needed. Thanks to all operators who reported in each evening.

NATURAL DISASTERS ORGANISATION ANNUAL EXERCISE

The annual Natural Disasters Organisation exercise, COMCOORD 2, will be held over the period 7th to 9th November, 1979. The exercise scenario includes a cyclone in Darwin and an earthquake in Adelaide.

Preliminary discussions with NDO suggest that WICEN may be involved on the 8th and 9th November, and that activations in Adelaide and Darwin will be without warning.

To avoid confusion in other States not involved, ACT WICEN will be on listening watch for the duration of the exercise. States not involved may monitor the exercise but should not involve their local counter disaster authorities. State WICEN co-ordinators will receive a newsletter containing further details in due course. ■

CONTESTS

Wally Watkins VK2DEW

Box 1065, Orange 2800

CONTEST CALENDAR

September:

8/9 EUROPEAN PHONE CONTEST
15/16 SCANDINAVIAN CW CONTEST
22/23 SCANDINAVIAN PHONE CONTEST
22-Oct. 10 "STRADIVARI" CONTEST

October:

6/7 VK/ZL/OCEANIA PHONE
13/14 VK/ZL/OCEANIA CW
13/14 RSGB 21-28 MHz PHONE
20/21 RSGB 7 MHz PHONE
27/28 CQ WW DX PHONE

November:

3/4 RSGB 7 MHz CW
24/25 CQ WW DX CW

STRADIVARI CONTEST

Artistic certificates and special valuable prizes will be awarded to amateurs who submit written confirmation for contacts with amateur stations located in the district of Cremona.

Period: From 0000Z 22nd September to 2400Z 10th October, 1979.

Bands: 80 through 10.

Modes: Phone and CW.

Call: Phone, "CQ STRADIVARI CREMONA"; CW, "CQ STR CR".

Only one contact with the same station on the same band on whichever mode in the same day allowed. Contacts with the same station on whichever mode and in the same day are allowed on different bands at least one hour later than the previous contact on other band.

Score: VK stations, two points for each valid contact and double score for 28 MHz contacts.

Certificates will be awarded to VK stations scoring at least 30 points.

A special and valuable prize will be awarded to the station with the highest score in Oceania.

Confirmations to: ARI, Sez. Di Cremona, Box 144-26110, Cremona, Italy, not later than December 31, 1979, and consisting of station reporting log — serial No. (start 001), time, date, call, band, RS(T), of each contact. One QSL card for each contacted station and 10 IRC. ■

AROUND THE TRADE

VICOM RELEASES COMMUNICATIONS COMPUTER

Vicom has released the latest in microprocessor technology with the Tono Theta-7000 communications computer, specially designed for the Amateur Radio Operator.

The computer offers facilities for both transmission and reception of RTTY, CW and ASCII, plus video output for monitoring, and a parallel port for a hard-copy printer.

Firmware provided includes the usual housekeeping, cursor and scrolling functions, plus the ability to interface with another microprocessor unit.

Information can be recorded and played back using an external tape recorder which adds to the flexibility of the unit.

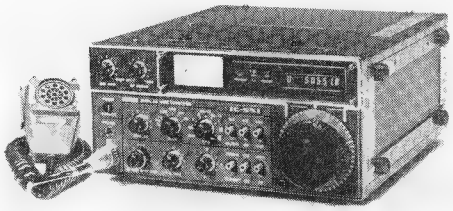
A spokesman for Vicom said that sales of the Theta-7000 had exceeded all expectations. "The Tono is packed with features and tricks not previously available with other units. A number of enterprising amateurs are using the units to completely control their ham shack functions," the spokesman said. The Theta-7000 retails at $739 and is available throughout Australia and New Zealand from the distributors, Vicom International Pty. Limited and their dealer network. ■

NEW 6 METRE ALL MODE TRANSCEIVER

ICOM have just released the export version of the 6 metre all mode transceiver. The IC551, as it is called, follows in the tradition of the IC211 (2 metre) and the IC701 (HF) in that it is the same size and appearance but with increased facilities.

The ICOM IC511 covers 50-54 MHz and the export versions to Australia will have the optional FM and passband tuning units installed. Modes covered will be FM, SSB, AM and CW, with the dual VFO system as used in the IC211 and 701 part of the package. Memory is provided (three frequencies) and a scanning function with variable speed can be switched in to cover the whole band.

Power output is a nominal 10 watts.



Price is expected to be around $800 and enquiries on availability should be directed to the Australian distributors, Vicom International Pty. Limited, 68 Eastern Road, South Melbourne. Phone 699 6700. ■

SCALAR HF BAND AMATEUR MOBILE ANTENNAS

A new range of mobile antennas for use in the HF amateur band 80-10 metres has been announced by Scalar Industrise.

The new Scalar HF resonator system consists of a radiating support mast section topped by one or more screw on resonators, covering the 80, 40, 20, 15 or 10 metre bands. When used alone the mast section serves as a quarter wavelength antenna on either the 6 metre (model SC6M) or 2 metre bands (model SC2M).

Mounting a single resonator on top of either mast converts it into a quarter wave resonant, top loaded vertical antenna. Individual resonators cover each of the 80m, 40m, 20m, 15m and 10m band and are user adjustable to resonant frequency by means of the tuning spikes.

The addition of a triband attachment (model SC1015) at the top of either mast enables conversion to automatic duo-band or triband operation.

The SC6M mast is manufactured of high grade aluminium, anodised. It is designed to fit on a heavy duty base, having a standard 3/8 in. x 24 TPI female thread.

The SC2M mast fiits on either a roof or ski bar mounted base or guttergrip type base, having a 5/16 in. x 26 TPI male thread.

Further details may be obtained from Scalar Industries Pty. Ltd., 20 Shelley Ave., Kilsyth, Vic. 3137. ■

NEW GREAT CIRCLE MAP

GFS Electronic Imports have just announced the release of a new Melbourne Centred "Great Circle Map". The map, measuring 33.5 x 43 cm, allows the user to obtain bearings on the shortest distance to any place in the world.

By laying a ruler on the map the correct bearing, in degrees, for pointing an antenna to a particular country is given. Also the shortest distance, in miles or kilometres, can be read at the same time.

For more information, contact the publishers, GFS Electronic Imports, 15 McKeon Road, Mitcham, Victoria 3132, (03) 873 3939. Price is $1.00 plus 75 cents post and packaging. ■

HOME COMPUTER WINNER

Kevin Reville of Frenchs Forest, NSW, winner of the Dick Smith "Win a Computer" competition held during the recent Home Computer Show, Sydney, receives his prize of an Exidy "Sorcerer" Personal Home Computer from Dick Smith.

Kevin, a computer consultant, is also a part time lecturer in commercial data processing at Sydney technical colleges. The "Sorcerer" will assist Kevin in class room demonstrations and for processing student programmes. ■

IMARK NOW IN MELBOURNE

As from August 1st, 1979, Imark Pty. Ltd. will be situated at 167 Roden Street, West Melbourne. The new phone number will be 329 5433.

The change in location from country Ararat is planned to coincide with the release of the Sawtron 880 UHF CB transceiver, the "New Generation" SBE 27 MHz CB transceivers, the NDI 2 metre and the Belcom 43-440 MHz amateur transceivers.

All Imark products will be on display and (where practicable) set up to work. For this reason retail customers are also welcome and there will be some opening specials available for early birds, too.

Imark are well known for their comprehensive range of Japanese transistors, diodes and ICs, as well as CB spare parts. These will be still available in the usual prompt fashion by mail order as well as being available direct from 167 Roden Street, West Melbourne.

While Imark's interstate customers will receive the same prompt service they have become accustomed to, Victorian trade customers and dealers will find the new location very convenient. Furthermore, Melbourne retail CB and amateur customers will welcome another supplier in their midst, as they are well known for their "shopping" habits. ■

HAPPY BIRTHDAY

R. H. Cunningham Pty. Ltd. is celebrating its 30th anniversary this year. It was founded in 1949 by Bob Cunningham following retirement from the RAAF. The company has become known as one of the leading electronic/electrical distributors of components and professional audio equipment in Australia.

Bob is known to many readers as VK3ML.

Many amateur stations in the 1950s used Geloso and Eddystone equipment supplied by R. H. Cunningham.

R. H. Cunningham Pty. Ltd. has decided to concentrate all its efforts in the professional audio market. Effective from June 4, Rifa Pty. Ltd. has taken over the marketing of Cunningham's non-audio product lines which include Bulgin, Eddystone, Sonnenscheln, Stettner and Q-Max.

Jim Cunningham, managing director, said "the decision to specialise in audio follows the success of the Sennheiser product range covering dynamic headphones and microphones, RF radio mikes, infra-red cordless headphones, condenser microphones and test equipment.

"The Swiss made Neutrick XLR-twpe audio connectors introduced only one year ago have had tremendous acceptance, and are now in wide use throughout the audio industry."

Dowkey/Kilovac coaxial and vacuum relays, together with Vitavox loudspeakers and microphones, remain an important sector in Cunningham's marketing programme. ■

SHORT FORM ANTENNA CATALOGUE

A short form catalogue describing Australian made VHF and UHF base station antennas has been issued by Antenna Engineering Australia of Kilsyth, Victoria.

The condensed information covers simple ground plane and vertical dipole antennas, to high gain omni-directional colinear arrays, dipole arrays, yagis, corner reflectors and mounting hardware. Individual data sheets fo all new models will be available.

Copies are available on request from Antenna Engineering Australia, PO Box 191, Croydon 3136. ■

QSP

GLASS FIBRE WAVEGUIDES

It is not possible to reproduce in full an article in the May 1979 issue of the Telecommunication Journal, but a few extracts are interesting. Light, being an electromagnetic wave of the same kind as radio waves, has an information transmission capacity of 100 Gbit/s — enough for 1 million digital telephony channels. Research by Drs. Kao and Maurer in the 1960s, following the discovery of the gas laser, led to the production of glass fibre waveguides of two glass materials with different refractive indices known as the "step-index fibre". Other types were then developed with a refractive index continuously variable from the core centre to the periphery — "graded-index fibre". At the present time there are glass-fibre systems working with a transmission capacity of 44 Mbit/s and systems for 274 Mbit/s are planned, all with an attenuation below 1 dB/km at the specified wavelength. A small quantity of silicon replaces a large quantity of copper and also results in lighter and more flexible cable immune to external electromagnetic disturbances. Another item in the journal reports a new 15.4 km link public telephone network link in W. Germany using cable about 7 mm thick consisting of a pair of glass fibres with a diameter of 0.1 mm. Up to 480 telephone calls can be transmitted simultaneously and separately. The June 1979 Proceedings of the IREE Australia is devoted to optical fibres. ■

Join a new Member

DIVISIONAL NOTES

VIC. DIVISION NOTES
VK3BWI, BROADCASTERS

PHOTO 1

PHOTO 2

PHOTOGRAPH 1

The smiling face of Dale VK3AAE adorns the studio (?) of VK3BWI. Dale is a regular announcer and contributor to the Victorian Division Sunday morning broadcast. A member of the Frankston and Mornington Peninsula Radio Club, Dale is very active as the Publicity Officer and always presents an interesting and informative segment for the broadcast.

PHOTOGRAPH 2

Paul Higgins VK3BEK at the VK3BWI console. Paul, himself an announcer on Melbourne commercial radio station 3MP, is yet another contributor to the Victorian Division broadcast. Paul's professional manner on air guarantees a well-oiled broadcast. The call sign VK3BEK may be familiar to listeners on 160 metres, as Paul is a keen 160 metre AM operator, along with a host of night owl stations. ■

GEELONG RADIO AND ELECTRONICS SOCIETY

At the recently held Annual General Meeting the following office-bearers were elected:—

President, A. Chalmers VK3NOR; Vice-President, R. Tippett VK3NMF; Secretary, R. Francis; Treasurer, W. Erwin VK3WE.

General Committee: W. Bond VK3BWS, M. Fenton, K. Vriens VK3AFI, R. Wheller VK3NOF, G. Wilson, L. Wilson.

Special Officers: Syllabus Officer, G. Wilson; Librarian, R. Trevor; Publicity Officer, K. Vriens VK3AFI; Store Officers, G. Wilson, W. Bond VK3BWS; Caterers, Ladies' Auxiliary; Auditor, L. Wilson; AF Officer, B. Mahon; CB Officer, C. Blues; RF Officer, R. Wheller VK3NOF; Equipment Officer, R. G. Green VK3AYQ.

According to the recently adopted constitution, the new office-bearers will remain in office for a period of two years.

The printed circuit board equipment is used a lot, and the addition of materials and facilities for members to produce their own art work and negatives has created even further interest.

Project building activity is very high at present, with projects varying from a touch oscillator, a remote digital control unit to an IC22S channel scanning unit.

Novice and advanced classes (free to enrolled members) are run on Monday nights from 1900 to 2100 hours.

Club meetings are held on Thursday nights at 2000 hours. Visitors are welcome.

The Society's rooms are located at the Belmont Common. For further information write to: The Geelong Radio and Electronics Society, PO Box 962, Geelong, or ring (052) 93337 or (052) 21 3658. ■

COMMERCIAL KINKS

With Ron Fisher VK3OM
3 Fairview Avenue, Glen Waverley 3150

This month two very simple modifications for two popular transceivers, the FT-7 and the FTDX-401/560.

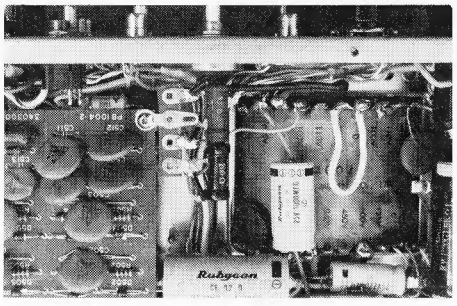
LET'S START WITH THE FT-7

Allan McKercher VK7NAT has come up with an idea that should please CW operators. As FT-7 owners will know, the CW side tone level can only be adjusted by means of the internal preset control. With Allan's modification the side tone level can be varied with the normal AF gain on the front panel. Here is how to do it:

Remove PB1648 (AF unit) and remove R617 (100K). Connect a small .047 ceramic capacitor between pin 10 and pin 11 of this board. This allows the side tone to be fed to Q603 via the AF gain control. Next readjust the side tone preset VR701 (PB1622A) to about the 11 o'clock position. It is now possible to turn the side tone up or down with the normal AF gain control.

NOW TO THE FTDX-401

One of the main problems with this transceiver (in my opinion) is the high noise level of the cooling fan. I put up with this for a long time but finally enough was enough. The solution proved simple: A series resistor was all that was needed. The AC supply to the fan comes off the power transformer primary winding and is easily accessible. After some experimentation a value of 700 ohms was settled on. This appeared to make very little difference to the amount of air being moved but it dropped the pitch of the motor noise to a very acceptable level. The photo shows how the resistor was mounted or as in this case two two resistors in series. A single resistor would need to be rated at five watts.



The next edition of Commercial Kinks will return to our old friend the FT-200 for an interesting AGC modification. ■

SPECIAL NOTICE TO "AMATEUR RADIO" READERS

In the June issue of "Amateur Radio", an advertisement appeared for Dick Smith Electronics on the inside back cover.

We have discovered that the advertisement is not valid as the artwork is over 13 months old. This is not the fault of Dick Smith Electronics but an oversight by "Amateur Radio" production staff.

The correct advertisement as should have appeared in June is in this magazine.

Dick Smith Electronics have suffered considerable embarrassment over this error and would like us to point out on their behalf that publication of the ad was completely beyond their control.

We apologise to any readers who may have been misled by this unfortunate error.

HAMADS

- Eight lines free to all WIA members. $9 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.
- Repeats may be charged at full rates.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTHR means address is correct as set out in the WIA 1979 Call Book.

FOR SALE

Crystals, suit Ken KP-202, five commonly used 2m FM European channels, Simplex S0, S21, repeater R5, R6, R7, $15. VK8SU/1, Box 1231, Canberra City, ACT 2601.

Drake T4X SSB/CW Tx, 200W input DC, matching AC power supply, Dyn desk mic, Drake R4A Rx with accessories of full short wave band xtls, Drake noise blanker, Drake CW filters, Drake MS-4 commun spkr, Cushcraft vertical HF antenna cable and RG8U connectors all supplied, $675 full price. All equipment in mint condition. James VK2JO, GPO Box 5076, Sydney 2001, NSW. Ph. (02) 36 7756 A.H., (02) 389 7786 Bus.

SM220 Monitor Scope with BS-8 adaptor (new), $380; Swan 240 with ext VFO, AC and DC supply and spare set of valves, $200, ONO. Bruce Beresford VK2RT. Ph. 520 7838.

Complete Icom Station: Icom IC 701 HF SSB Transceiver, IC 701 PS power supply, IC RM3 remote control unit, IC SM2 desk mic, only 4 months old, the lot for $1500 cash; IC 502 6m Txcvr, 4 months old, hardly used, as new, $220, ONO; IC 202 2m Txcvr, c/w Oscar xtal, little used, as new, $220, ONO; 6m linear, 2 x 6146A, 90W from IC 502, $50, ONO. VK2ADS, "Barcoo", Tambar Springs 2381. Ph. (067) 44 1749.

Frequency Meter, BC221, complete with original frequency charts and hand book, also additional circuits for use with BC221, all excellent condition, $50, ONO. T. Ogden VK2VDC. Ph. (063) 42 2873, after 6 p.m.

Standard C146A Hand-held FM Transceiver with nicads (no charger) and channels 40, 50, R4, R5, R8, new condition, $150, ONO. Reg VK3KK, QTHR. Ph. (03) 652 8110 Bus., (03) 469 4200 A.H.

Video Display Board as per EA article, $120. N. Osborne VK3YEI/2, 76 Monaro Ave., Kingsgrove, NSW, or c/o ph. Melb. (03) 90 6424.

Galaxy III Triband Tcvr, v. good cond., new filter, orig. pwr. supply, mic. and manual, $230, ONO; HW-32A 20m monoband Tcvr, coil and xtals for 80 and 40m if wanted, h/duty pwr. supply, needs work, best offer. VK3AQD, QTHR, or Ph. (03) 459 6445.

FT DX 500 CW Filter, $350; FT101 80/10m AC and DC/DC conv., $400; some spare tubes and manuals; both sound cond. Gordon Bracewell VK3XX. Ph. (03) 876 2448 A.H.

2m FM Base Station, MR10C, $30; also 2m MR3B carphone junior with transistorised power supply and crystals, $30. VK3BLR, QTHR. Ph. (03) 874 3583.

Kenwood TS600 6m Transceiver, very little use, perfect cond., $550; Pye 739 base Tx/Rx, solid state with 6/40 final, xtals for ch. 40 and 50, $75. VK4ZRF, QTHR. Ph. (07) 349 1488 A.H., (07) 225 4477 Bus.

Transformer 1500, 1250, 1000 750, 500 CT, 500, 750, 1000, 1250, 1500V, 500 mA, FIL 2.0V 10A, 5V 3A, $35; 866/866A rectifiers for above, 4-off, $20, ONO; sockets and 2 x 50,000 ohm 120W bleed resistors, free if all taken. Allen Crewther VK3SM, QTHR. Ph. (03) 386 4406 A.H., (03) 630 5794 Bus.

6m Transverter 6/40 final VK3 Rx converter, part built, $40; CDE AR-22L rotator, unused, $60; multiple lengths coax, UR67, etc., plus box N type connectors, $20. VK2YCS. Ph. (02) 44 3141.

Drake R4A HF Rx, ham and int. SW freqs., 500 kHz bands, NB and .4, 1.2, 2.4, 4.8 kHz filters; Drake MS-4 speaker, owner's manual, in exc. cond., $575. James VK2JO, GPO Box 5076, Sydney 2001, NSW. Ph. (02) 36 7756.

KW2000E Tcvr, 160-10m, like new, $500, ONO; FT7 with FP-4 power supply and crystal for 28 to 28.5, 3 mths. old, $450, ONO; transverter, 11 to 80m, works well, $40; YD-844 desk mic., $30. Must sell. Ph. (052) 75 2421 after 6 p.m., or write 54 Spruhan Ave., Norlane 3214.

Multi-Palm II hand-held 2m Transceiver, repeaters 2, 3, 5 and 8, Simplex 40 and 50, as new cond., also nicads, charger and leather case, $230, ONO; Johnson Viking 10m transceiver, 20W PEP, 28.300 to 28.620, never been mobile, as new cond., $120, ONO. VK3BNJ. Ph. (03) 743 6708.

Deceased Estate: Collins 32 S1, updated freq. spot fac., complete with 516 F2 240V AC PS, 75 S1 110V with trans., all hand books and cables, plus 14 new spare tube types and 2 new 6146 finals, $950; Collins MM1 hi imp. mobile mic. and plug, $50. VK3CP, QTHR. Ph. (03) 859 2614.

FT620 6m Transceiver, 50-54 MHz coverage, good cond., recent Tx and Rx check to spec., LO board improved, $300. VK4ZZI, QTHR. Ph. (07) 224 6875 Bus.

Barlow-Wadley Rx, needs new whip aer., $130; IC215 FM portable, ch. 40, 50, R2, 4, 6, 7, 8 and reverse 8, $199; IC202E SSB portable, 144 to 144.6, plus Oscar, $199; xtal filters, 10.7 MHz, 10 kHz, B/W, 6 only at $5 posted. VK3YIX, QTHR. Ph. (050) 24 2104.

FRG7 Comm. Rx, as new, $230; Leader LSG 11 sig. gen., $50; Sanwa 501-ZX multi-tester, $50. VK3MU, QTHR. Ph. (03) 82 2747.

Selling Surplus: TWA base 6/40 Rx out. AWA sig. gen. with atten. 120-300 MHz, 2m 20A, 6m 10B with xtals, goers, hand-held Lafay Rx FW 140/175 Mhz, BC 221 calib. with book, B28 rough, 2 x 813 and a 6/40, new, consider any offers. VK2AEM, QTHR. Ph. (02) 871-8183.

ETI DG640 Software Controlled VDU, perf. working cond., with some software, $110, ONO; also ETI 630 VWU kit, have nearly all components, $80; dig. freq. readout for IC22S, in perf. order, $20. Graham VK3YLA. Ph. (03) 669 4329 Bus.

Swan 700 CX SS-16B Special, 700W PEP SSB transceiver, comp. with matching AC supply, special 16 pole filter and spare final tubes, mint cond., $850. VK5FR, QTHR.

Transceiver, Yaesu FT-620, 52-54 MHz, SSB, AM or CW, 240V AC or 12V DC, and Yaesu V7-75 voice controller unit, also 6 el. yagi, $425, ONO. Ph. (02) 521 3652.

Monitor Scope, bargain, Heathkit SB610 kit, complete with all manuals, factory packed and unused, victim of XYL's clean-out ultimatum, $200. VK3ATR, QTHR. Ph. (03) 336 1054.

IC700R Comm. Rx, solid state, 3.5-29 MHz, sensitive, selective easy interface to Tx, controls — tune, band, preset, RF gain, AF gain, mode (AM, ANL, SSB, CW), RIT, S meter, 9 MHz xtal filter, many other features, immac. cond., photos avail., $250, ONO. VK2BTM, QTHR.

AWA Teleradio 60A Tcvr., provision for 5 ch. in range 2 MHz to 10 MHz, AM, transistorised except for driver and 6146 final, runs off 12V DC, suitable for conversion to 160m without xtls, $100. VK3APL, QTHR. Ph. (03) 870 3715.

WARC 79 Convertible Transceiver, FT75 HB VFO, 11 crystals, suit novice, $320. 4BTV with radials, $85, SB500 2m transverter, $150. VK3AFW, QTHR. Ph. (03) 579 5600 AH.

Icom IC21A Deluxe Base Station, 2m FM Txcvr, Simplex 40, 50, 51, 53, repeaters 2, 3, 4, 5, 7, 8, $175. Matching DV21 phase locked digital VFO, $150; or $300 the pair. VK3ARZ, QTHR. Ph. (03) 232 9492.

Hallicrafters HT37 SSB Tx, 80-10m, very good condition, little used, also handbook and circuitry, $150. VK3MB, QTHR. Ph. (03) 707 2254.

Cushcraft ATB-34, $275; ATV-4, $105; CDE Ham 3, $225; Collins KWM-2, PM-2, 312B3, CC-2, $1895; Drake R4A, MS4 spkr, SW xtals, CW filt., $575. James VK2JO, GPO Box 5076, Sydney, 2001, NSW. Ph. (02) 389 7786 work, (02) 36 7756 home.

WANTED

Star SR550 Handbook and schematic diagram required urgently please, willing to pay any cost. Write F. Freemantle, PO Box 100, Yeronga 4104, Brisbane, Qld.

SILENT KEYS

It is with deep regret that we record the passing of —

Mr. E. C. READING	**VK2LT**
Mr. F. A. VARRUTHERS	**VK2PF**
Mr. B. SCETRINE	**VK7BI**

Daiwa 144 MHz Mobile Rx, must be in good cond., detals to L30997, QTHR. Ph. (053) 35 9031.

Old Copies of "Radio and Hobbies" (before 1952), also copies of Amateur Radio (before 1947). VK3BCC. Ph. (03) 561 1151.

Galaxy 5 Txcvr. Price and details to Reg Bulman VK4YL, Box 238, Malanda, Qld. 4885. Ph. (070) 96 5131.

Kenwood TS600A 6m Transceiver in working cond. Write to Reg VK3KK, QTHR, or Ph. (03) 652 8110 Bus., (03) 469 4200 A.H.; all letters answered.

Circuit Diagram or any other information on a Plessey B47 38-56 MHz transceiver, will buy or photostat the original and return immediately to sender; Plessey B47 38-56 MHz transceiver in any cond., to be used for spare parts. Lionel VK3NM, QTHR. Ph. (03) 88 3710 home, (03) 568 2733 Bus.

TRADE HAMADS

QSL Cards, Log Books, Contest Sheets — send 20c stamp for samples and prices to Linda Luther VK4VV, PO Box 498, Nambour, Qld. 4560.

TRADE HAMADS

For a very long time commercial advertising has not been accepted in AR Hamads, but as the result of discussions at the 1978 Federal Convention a decision was made to open up a "Hamads-Trade" section. The rate will be $10 for 4 lines plus $2 per line (or part thereof), minimum charge $10, prepayable. Copy is required by the first day of the month preceding publication. This will mean that in future ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes. ■

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NOTE — Our prices are set as low as we can sell at and still remain in business. We are unable, therefore, to adjust our prices if we are undersold. All we can say is, "Good luck to them."

ROY LOPEZ

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RG-8U foam coax cable, per yard 80c
8-cond. rotator cable, per yard 60c
⅞" H.D. VHF/UHF coax, per yard $3
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Voltage regulator 18V AC input 12V DC 3A output $23
240/18V AC transformer $10
5 meter RG-58U coax cable with PL-259 one end $2.50
Mobile bumper mounts ⅜" 24 thread $5
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TS-520S 10-160M transceiver .....P.O.A.
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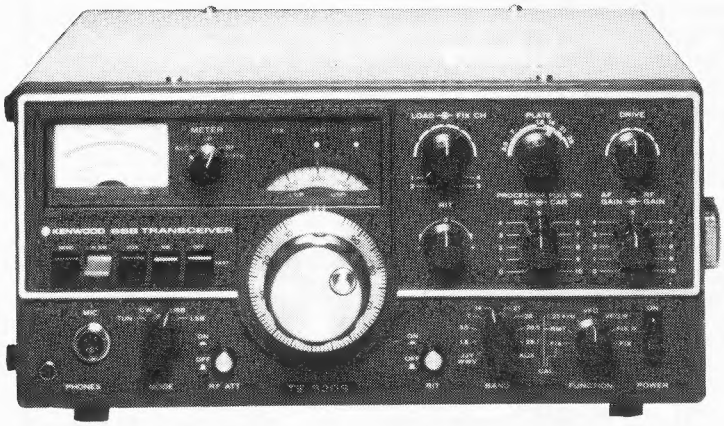

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